RR

SEPTEMBER 1952

American Engineer

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● **BUILD A BETTER AMERICA**
By J. Edgar Hoover,
Director, Federal Bureau of Investigation

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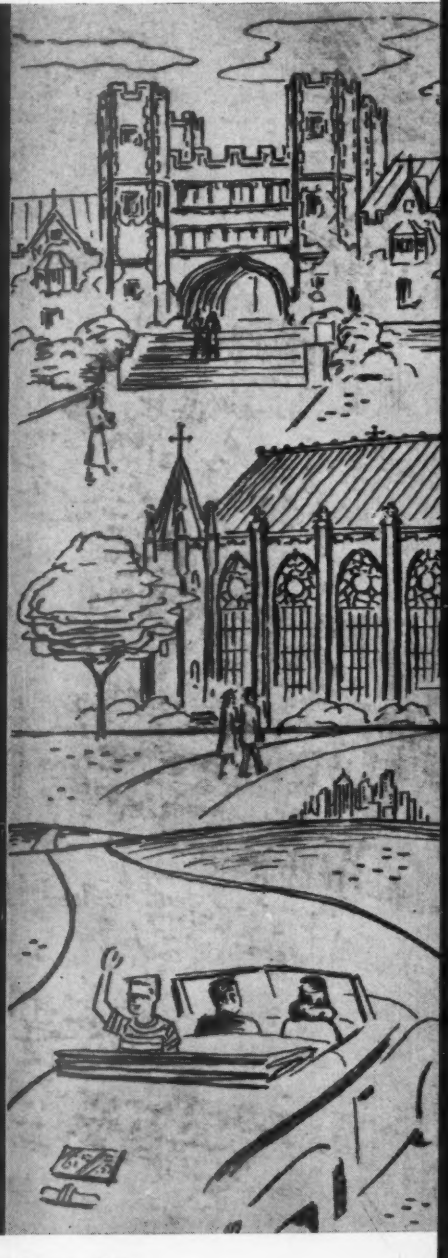
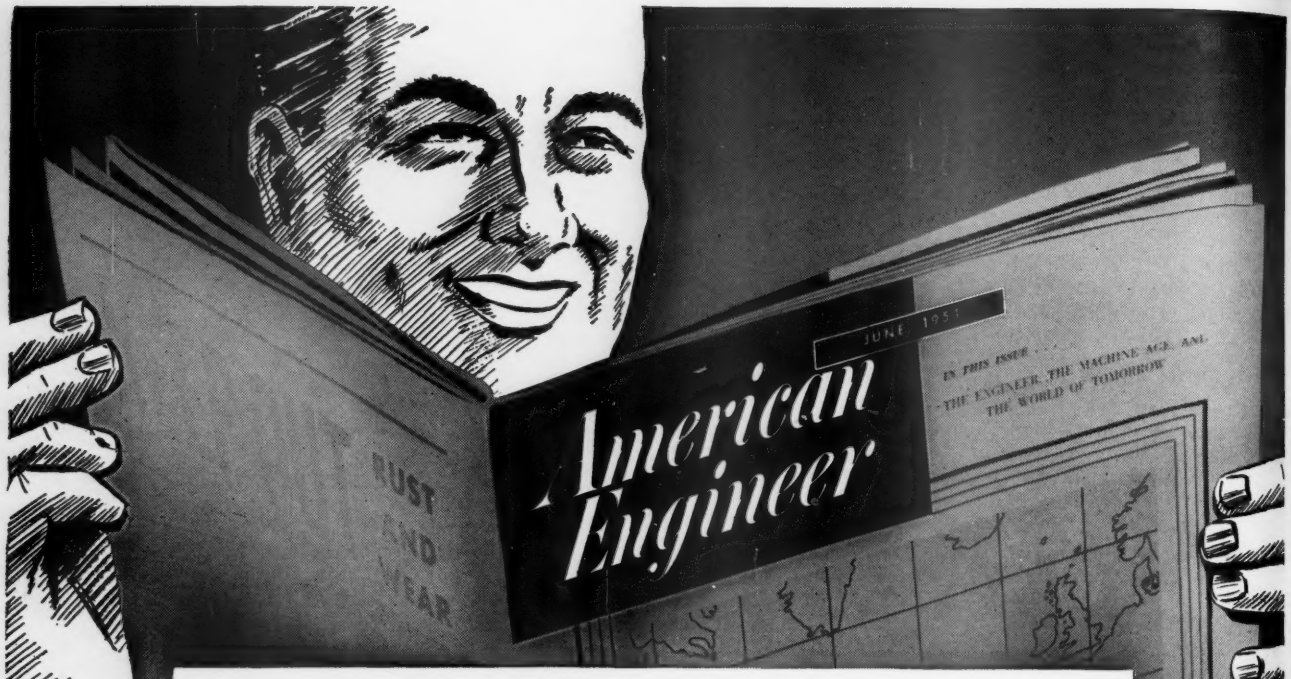


Engineers Can Help Their Country As Builders and Professional Men, J. Edgar Hoover Says

. . . *Also*

The Submarine—Man's Ancient Fascination ● **Conveyors—America's New Transportation** ● **How We Use The Industrial Professorship Plan**



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American Engineer

Letters

Bureaucratic Design . . .

Dear Editor:

I was surprised to read on page 4 of the June issue of the AMERICAN ENGINEER under "Professional News in Capsule Form," an article advising our members where to reach the Federal Employment Service in connection with securing jobs to "*design*, construct, maintain and operate hospital buildings, quarters and other structures, grounds, utility plants, etc." The fact that the Veterans Administration, along with many other government agencies, produce their own designs is contrary to the interests of both the engineer and architectural professions, and as both organizations are opposing this procedure on the national level, the AMERICAN ENGINEER should eliminate all items from its pages that tend to condone the idea of bureaucratic design.

ELMER S. TUTHILL, P. E.,
Summit, N. J.

Salary Improvement . . .

Dear Editor:

Reference is made to President Coleman's message appearing in the AMERICAN ENGINEER, August, 1952. In this message Mr. Coleman mentions "five major objectives" as being challenges that the NSPE must meet during the coming year.

Most noticeable as being missing in the above mentioned objectives is a sixth one namely: the improvement of the economic situation as confronts the great majority of the engineers, below the administrative or management levels, working for salaries. This group of men seem to be the "forgotten man" when Mr. Coleman propounded the said five objectives.

Unless Mr. Coleman changes his mind and includes the above-mentioned "sixth objective" in his line of thoughts then sooner or later some organization such as the ESA, CIO, AFL, IWW or "what have you," will present a line of action that will be attractive to this group of engineers and as a result these men will become "card carrying" members of one of the organizations mentioned instead of being members of a recognized engineering organization. This, we trust, will never develop, but if NSPE or some other organization does not show some action in an attempt to improve the economic situation mentioned then the matter of some other outfit taking over can not be circumvented. The salaried engineer will, because the necessity of self protection, be forced into joining one of these last mentioned groups.

On page three of the same issue in a letter to you by Mr. Carl M. Ratliff, P.E., the above matter and others are touched upon, all of which is most interesting and offers much to be considered.

E. G. VAN LEEUWEN, P.E.
San Luis Obispo, Calif.

P.S.—Here's a prediction:

At the ASCE Centennial coming up in September, and with representatives of all recognized engineering societies in attendance, no action of any kind will be taken or even considered relative to this matter of improving the economic level of the "working" engineer. To back this up I will lay a cigar on the line.

Caustic Comment . . .

Dear Editor:

Being a member of the Society and a recipient of the magazine AMERICAN ENGINEER, I wish to state: "I especially prize the letter to the editor "Time To Go Fishing," in the July issue, to the extent that I have caused to be placed thereon a notation—reading in effect:

"Article on page three (3), checkmarked by red crayon—demands considerable forethought by the engineering group; irrespective of the fact that Editor certainly, let himself in for a vast amount of criticism—when its printing was allowed, minus footnote relative to the true status of the article. Further, it's to be observed that if the subject be true in its principle, then the Steel Institute of America has obviously wasted a lot of time in preparation of its manuals concerning the manufacturing of various sections of steel."

As a Construction Engineer I apprise the article as a magnificent idea, also magnetic if it works! But, let's console ourselves with two simple questions: (a) is it likely that the profession will accept this formula —without further protest: (b) and why, has the AMERICAN ENGINEER, readily accepted for printing such an article—less, any comment concerning the validity of the theory stated? ? ? Again, are the patrons whom we (engineers) serve to be given to understand that they were unwittingly not justified in the employment of the engineer, and that all computations he rendered have been entirely useless. . . . . etc.

Finally—why should such articles appear, less the usual comment by our editors? Are we to believe as engineers, that our magazine is no longer—an authority for the items that are printed in its pages? ? ? How will our contractors accept such ideas?

Portion of article that deals with Stability of Concrete is about as flamboyant and phenomenal as the section relative to steel members; yet, any application of either or both rules not likely will astound the scientific world to the extent that such phantasy ever will be adopted in lieu of already time tested formulas and laboratory analyses by our top-notch firms or individual practitioners.

CHARLES C. HUMMEL, P.E.,
Espy, Pennsylvania.

Correction . . .

Dear Editor:

I am writing to request a correction of the item referring to me on page 6 of the August issue of THE AMERICAN ENGINEER. The design described is that of the official first day cover and not that of the commemorative stamp. The error is embarrassing to me and will lead to misunderstanding.

The design for the commemorative stamp has not yet been released, but I understand that it will show a covered bridge in the lower corner and the George Washington Bridge above it, all to symbolize a century of engineering progress.

I feel sufficiently honored in providing the theme for the officially adopted design for the first day cover to be mailed with the commemorative stamp on the first day of issue.

I shall be grateful if you will make a suitable correction in the next issue of THE AMERICAN ENGINEER, noting that the error was not mine.

D. B. STEINMAN, P. E.,
New York, N. Y.

► **The AMERICAN ENGINEER, of course, accepts full responsibility for**

(*Continued on page 5*)

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Professional News in Capsule Form

Hoover Calls For More Engineers • Defense Department Requires Standard Curves • RPT Gives Honorary Degrees • Other Items of Interest

Former President Herbert Hoover recently attended the Northwest Engineering Centennial at Portland, Oregon, where he was awarded the Engineer of the Century Award from the group. In his acceptance speech, Mr. Hoover remarked:

"Both political parties' platforms agree that the nation is mired down in a swamp of spending, inflation and taxes but that the parties disagree on who is to blame.

"A partial remedy for our ills is to stimulate scientific discovery, invention and their application by our engineers."

The former President said two obstructions to such a solution of economic problems could be "unintelligent taxation" and "a coming national famine in technologists."

He said the engineering profession now faced a "great national problem" a shortage of engineers.

"We do not have enough engineers in incubation to carry on the nation's work," he said. "We need 60,000 new technologists a year to supply national needs. Our engineering graduates have dropped from 50,000 in 1950 to 38,000 in 1951, and the students in training indicate less than 30,000 next year."

* * *

The Department of Defense has taken action to require the Army, Navy, and Air Force to use standard curves in negotiating architect-engineer contracts whenever it is practicable to do so. This action follows a similar decision by the Army's Corps of Engineers earlier in the year (May issue, AMERICAN ENGINEER*). The Defense directive and the standard curves to be used are classified documents, hence not available for distribution.*

* * *

America's oldest technical college, Rensselaer Polytechnic Institute at Troy, New York, rolled history back a hundred years recently when it awarded civil engineer degrees to four engineering leaders.

The recipients were Charles F. Kettering, director and research consultant of the General Motors Corporation; Carlton S. Proctor, president of the American Society of Civil Engineers; E. D. Blackwell, 100 years old, of Goshen, Vermont, who graduated from Rensselaer in 1874 and who now is the school's oldest living alumnus; and Major Lenox R. Lohr, president of the Museum of Science and Industry in Chicago and also president of the Centennial of Engineering celebration being staged in Chicago this summer.

Staged as one of the features of the Centennial program, the Rensselaer ceremony was almost an exact reproduction of the institute's graduation exercise a century ago when the first degrees in civil engineering ever given in any English-speaking country were awarded to four of its graduates.

* * *

Conelrad is a new word coined by defense authorities to describe a method of controlling electro-magnetic radiations from broadcast stations, in a manner which will prevent enemy planes from homing to predetermined targets, by using broadcast station signals as a navigational aid, while at the same time providing a means of emergency communications for local and national civil defense authorities.

The plan calls for the cooperation of all standard broadcast, FM and Television stations in the United States, Canada, Cuba, and Mexico, together with the Federal Communications Commission and the United States Air Force.

Broadcast stations in the United States have spent approximately $1,500,000 *perfecting the plan without financial assistance from the federal government.*

* * *

Two important legislative items which were presented in the closing days of the 82nd Congress, too late for action, will be the subject of extensive discussion next year. Both will have a vital affect on the engineering profession and both are of a long-range nature rather than of immediate effect.

The first is a proposal for the federal government to undertake a program of assistance to needy students for college education. A considerable portion of the federally-supported program would be in engineering courses as it is provided that in time of national emergency at least sixty per cent of the authorized scholarships would be in national defense or defense supporting fields of study. The philosophy behind the suggested program is that the nation is losing precious human resources because many able high school graduates are financially unable to obtain higher education.

A statement issued by the Federal Security Administrator says: "If we are to insure that our science and our technology, both in the arts of peace and in the techniques of military defense, will continue to lead the world, we must train many more scientists and engineers."

The second long range proposal involves the reinstitution of the advance planning program, this time on a permanent basis. There have been two previous advance planning programs under which the federal government advances funds to states and municipalities to plan public works, the advances being repayable when the project is commenced.

Both of these legislative proposals are being studied by the Legislative Committee with a view toward an appropriate NSPE position. Details on the legislation will be carried in the Legislatve Bulletin.

* * *

RCA Victor revealed it has hired 16 *Negro graduate engineers and believes there is not one reasonably qualified Negro engineering graduate that hasn't received an attractive offer of employment.*

* * *

The National Science Foundation announces that award application forms for fellowships in a number of fields, including engineering, will be available after Oct. 1. Most of the fellowships will be awarded graduate engineers seeking higher degrees, NSF states.

Letters

(Continued from page 3)

the error made in the reporting of the stamp story.—*Editor.*

Titles . . .

Dear Editor:

In reference to my biographical sketch appearing in the August 1952 issue of THE AMERICAN ENGINEER, this is to advise that in the preparation of the copy for this article as forwarded to you, a mistake was made in the title of my position, which should have read "Director, Environmental Health Services," rather than "Chief Sanitary Engineer and Director of Environmental Health Services," as appeared in the article.

In view of this, I would appreciate your making a correction in my official title as noted above.

Sorry to have caused you this inconvenience.

ROY J. BOSTON, P. E.,
Director,
Environmental Health Services.
State of Georgia, Dept. of
Health, Atlanta, Ga.

Building Codes . . .

Dear Editor:

. . . in addition, I want to urge that the Professional Engineers at National, State and Local levels should investigate the Building Codes of their respective areas and communities and insist that all existing codes and all recommended codes or sample codes prepared by the various national and area advisory bodies be made to comply with the various state and territory registration laws.

In a recent check of ten published codes, including the Uniform Building Code of the Pacific Coast and the National Building Code of the NBFU, only two contained any reference to the state registration laws. The Amarillo, Texas, Building Code says: "Plans and specifications for buildings or for alterations to buildings, other than dwellings, where the estimated cost of the proposed work is three thousand dollars ($3,000.00) or more, or plans for alterations to any buildings, other than dwellings, involving structural changes, regardless of cost, shall be prepared by and shall bear the name, seal and registration number of a registered architect or a registered structural engineer."

It would appear that any code now in effect which does not contain such a provision is in violation of the state laws and should be amended at the earliest possible date.

DON V. PURINGTON,
Houston, Texas.

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For some time now business papers have been pointing out that management is having great difficulty finding high-salaried executives. Actually, management is *always* looking for such men—because they are the ones who mean the difference between profit and loss.

But just what do these men have that makes them worth so much money? First, it's a point of view. The executive must understand the broad principles of business procedure. He must know the methods and practices that have proven profitable for other companies and be able to apply them to his own business.

Does this seem easy? Frankly it isn't—the way to the top is never easy, but if you are really serious about becoming a $20,000-a-year, or more, executive, Funk & Wagnalls Company invites you to send for a free booklet by Carl Heyel. This new booklet gives you a complete outline of the famous Heyel Course in which 45 famous business executives describe their working methods and explain, clearly and simply, how you can make use of their combined knowledge and experience to qualify for the great opportunity in modern business. There is absolutely no obligation, no charge for this booklet, simply mail the coupon below.

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Read what this great engineer, who has conceived some of the technical marvels of our times, has to say about the profession's tomorrow.

Of Interest to All Engineers, Don't Miss It In the OCTOBER ISSUE

American Engineer

SEPTEMBER
1952

"Our present day diplomats are engineers and they take less pleasure from the marble fountain in a formal garden than from the sinking of a tube well or construction of an irrigation system."

—Eric Johnston, Chairman, International Development Advisory Board, Point 4

Kenneth E. Trombley,
Editor

●

David A. Heller,
Staff Writer

●

Arthur F. Beck,
Business Manager

●

A. C. Neff, P.E.,
Chairman, Publications
Committee, NSPE

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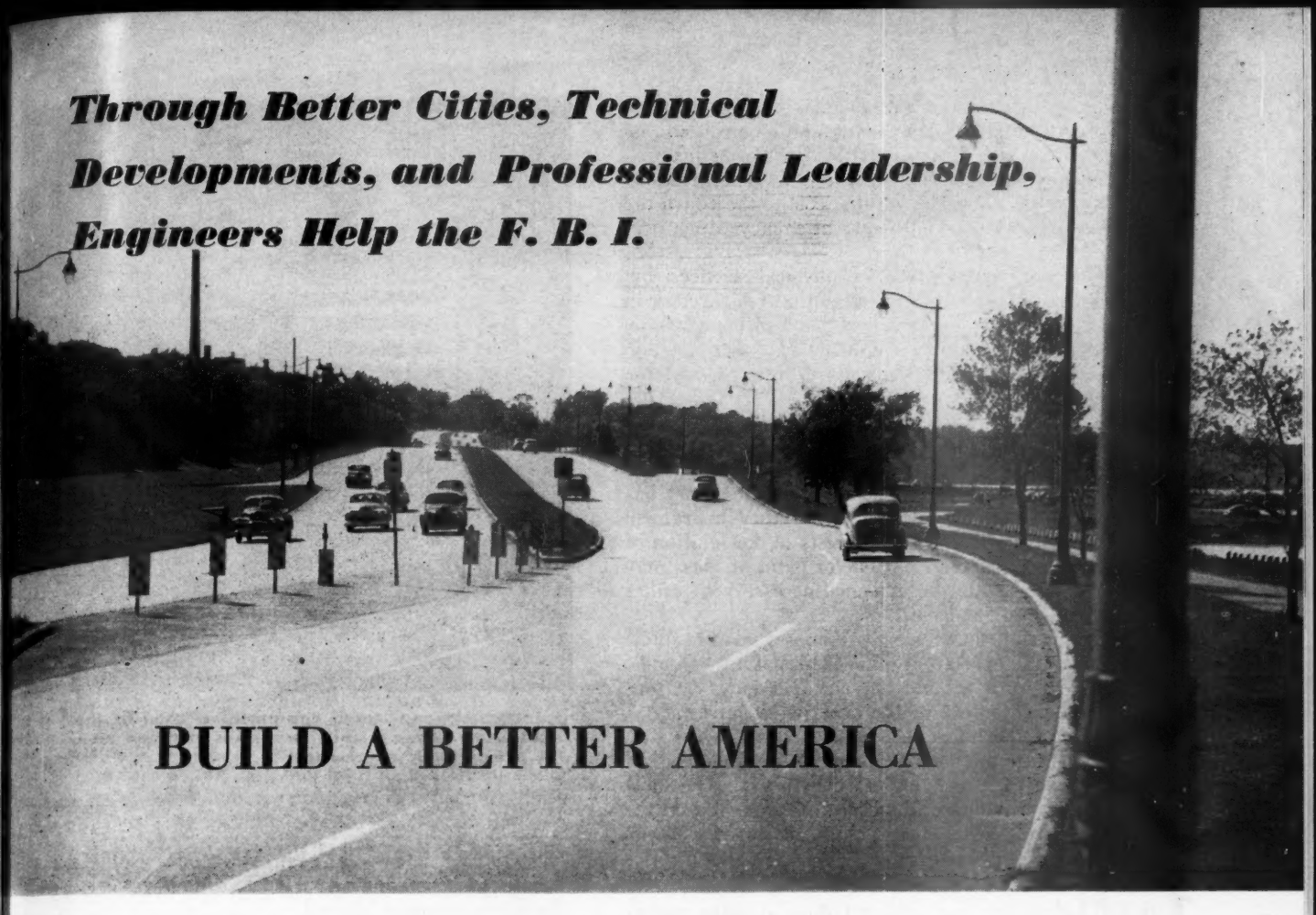
Through Better Cities, Technical Developments, and Professional Leadership, Engineers Help the F. B. I.



BUILD A BETTER AMERICA

By J. EDGAR HOOVER

Director, Federal Bureau of Investigation

KNOWING of the efforts of the National Society of Professional Engineers and its magazine, the AMERICAN ENGINEER, to stimulate the engineering profession to increased efforts in the field of community activity and good citizenship, it is a pleasure to discuss the relationship of law enforcement and the engineering profession.

It is a great deal closer than might be suspected at first glance. Engineering developments are making it more difficult every year to be a successful criminal.

This article will also deal with the help engineers can render their government in the prevention of sabotage.

It is, of course, obvious (but it cannot be repeated too often) that the ideal way to deal with the problem of crime is to prevent it from happening, and to help minor malefactors become readjusted before their offenses become serious.

Professional people have a special responsibility in this regard, in my view, because they are likely to be opinion leaders in the community. By virtue of their education and experience their opinions are given added weight by their fellow citizens. So, at the outset, it might be well to point out that professional engineers bear a direct responsibility for the improvement of conditions which breed crime.

Youth activities such as the Boys' Clubs of America, the YMCA's, community recreation projects, Boy and Girl Scouts, deserve the support of professional groups. So do churches, better school facilities and other like institutions which form the basis of our society. You may be certain that the Federal Bureau of Investigation appreciates the work these worthy institutions do. In a real sense, they are allies in the struggle against crime.

The importance of efforts aimed at crime prevention may be appreciated when one realizes that the second largest item on the total tax budget, local, state and national, behind only the cost of defense and the payment of costs incurred in past wars, is the cost of protecting society against crime. Even aside from the humanitarian aspects, money and effort spent on the prevention of crime is well spent from a purely dollars and cents standpoint.

To appreciate the detailed relationship between engineering and crime detection all that one need do is make a tour of the FBI Laboratory in the Department of Justice Building in Washington. In a very real sense, engineered scientific equipment is making it more dangerous every year to be a criminal. Such heavily-engineered devices as the electron microscope, for example, give FBI scientists a new weapon with which to combat crime.

Using an electron beam instead of conventional light rays, the electron microscope can magnify up to 22,000 diameters. Because of the limitation of the short-wave lengths of visible light, the ordinary optical microscope has an effective use limit of about 2,000 diameters. One enterprising FBI Agent figured that the electron microscope would theoretically have the power to magnify a dime up to a circle half a mile in diameter.

The FBI Laboratory itself is a tribute to engineering skill. Using the latest scientific equipment, the Laboratory's facilities are as freely and fully available to an investigating officer in the smallest department in the most remote village of the land as they are to an FBI agent.

The Laboratory acts as a national clearing house for information pertaining to scientific law enforcement, and its technicians are available for expert testimony in all courts. The Laboratory is supported out of FBI appropriations and all its services are given without cost to the court, the prosecutor's office, or the enforcement agency which uses them.

The Laboratory emphasizes the physical sciences, but the implementation and application of these sciences is, in many cases, dependent upon the precision instruments developed by the professional engineers of America. Science and engineering are kindred professions and the FBI Laboratory is a tribute to both.

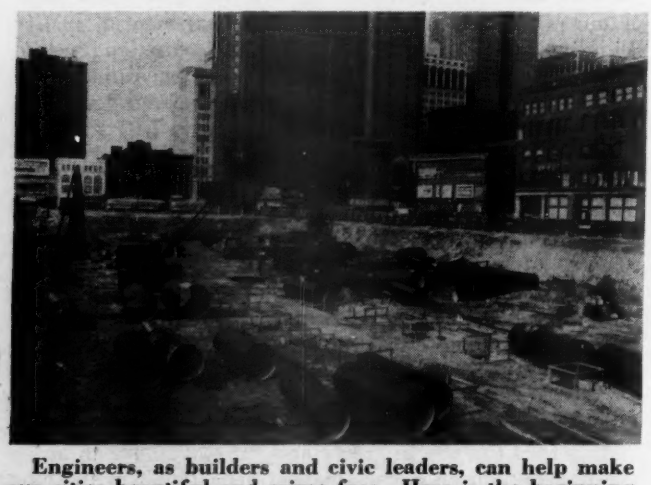
The spectograph is a fine example of a precision instrument that embraces both physics and engineering. This instrument is one of the most useful in the entire Laboratory and will serve to illustrate how a scientific theory has been engineered into a practical Laboratory instrument which, among many others used, assists in the solution of criminal acts. The smallest particle of paint or glass may and often does provide the evidence necessary to either convict or exonerate a suspect.

A typical hit-and-run accident provides a good example of the application of spectrographic examinations. In most cases the scene of a hit-and-run accident lacks obvious clues, but the trained eye of the experienced investigator seeks out minute particles of evidence, which, when submitted to scientific methods of identification might assist in bringing the case to a logical conclusion. The most common types of evidence found on the scene and on the car are glass fragments, paint chips, hairs and fibers, blood stains and soil particles.

THE FBI Laboratory has analyzed chips of paint smaller than the period at the end of this sentence. Generally speaking specimens this small, if found at all, are removed from the victim's clothing. An expert will mount the paint chip on its side, polish the cross section and finally by microscopic study, determine the layer structure. If more than one color is present, the original color as well as the color at the time of the accident can be determined.

By reference to the Laboratory's National Automotive Paint file containing specimens of more than 4,000 automobile paints used on cars manufactured in this country since 1932, and by spectographic and spectrophotometric analysis, the examiner frequently can notify the inquiring law enforcement agency the model of the automobile from which the analyzed speck of paint came.

The value of this type of examination can be readily seen from the following incident that took place in a Mid-



Engineers, as builders and civic leaders, can help make our cities beautiful and crime free. Here is the beginning of a new addition to Detroit's Riverfront Civic Center.

Intricately engineered equipment is used by the FBI to fight crime. Here a soil specimen is analyzed by means of the petrographic microscope.

western city a few years ago. Two boys riding a motor scooter were run down by a truck. One boy was killed and the other seriously injured.

The sheriff investigated the case and sent to the FBI Laboratory evidence from the scene of the accident and found on the truck believed to have struck the boys. Specimens of hair removed from the truck and scooter; sections of the grain box and pipe of a grain blower on the truck; a left front tire and front bumper; the seat of the scooter; paint from the left front fender of the truck, and the dead boy's overalls, were forwarded for examination.

By microchemical, spectrographic, and spectrophotometric analyses, Laboratory examiners determined that the red paint on the bumper and tire of the truck was similar to the red paint on the seat of the scooter.

Additionally, by the same type of examinations blue paint on the left ventilator of the scooter was found to be similar to the paint from the left front fender of the truck. It was thus possible to state that the truck and the scooter had, at one time, most probably been in contact.

Nothing can supplant the interested and patriotic citizen in the furtherance of successful criminal and security investigations. The engineers of America are in an excellent position to render the fullest aid to law enforcement, particularly in regard to sabotage attempts.

With their technical knowledge, as well as the nature of their positions, engineers are more sensitive than the ordinary person to the danger of sabotage.

The full significance of sabotage is little understood. It can be defined as the willful damage or destruction of property, as well as the intentional slowing down of production by attacking materials, machinery, or even plant personnel. Effective sabotage may be accomplished in an infinite variety of ways. Arson, bombs and explosives certainly have their place in the cataloguing of common sabotage methods, but I feel that mechanical sabotage would prove of the greatest interest to engineers.

Mechanical sabotage includes a vast field of activity which pertains to the destruction of machinery or materials by means other than arson or explosion. Liquids

for example, may be used most effectively by the saboteur. Solutions of either acid or alkali could be used in great variety as a damaging agent. It has been reported that acid has been used on guy wires or stay wires in order to weaken them to such a degree that they would snap as a result of a strain they were designed to normally withstand.

Sugar, syrup, honey, and molasses are very effective in damaging internal combustion engines and may be applied to either the lubrication or fuel supply. Any solid foreign material such as emery, carborundum, sand or other abrasives can produce disastrous results if placed in bearings or introduced into lubrication systems.

MECHANICAL maladjustments can be used as acts of sabotage against almost any industry or mode of transportation. The simplest example of such acts would be the closing of valves where they should remain open, as in sprinkler systems or a fuel supply. In addition to the previously mentioned acts of sabotaging machinery by using chemicals or foreign materials, it is also possible to cause severe damage by mechanical changes such as loosening flywheels, damaging drive belts, or by many improper mechanical adjustments which could appear to be accidental.

It was the experience of the FBI during World War II that many sabotage attempts were predicated on jealousy or pure maliciousness.

The case files of the FBI literally bulge with the sabotage efforts of discontented employees, or those of a malicious bent.

During World War II a case of sabotage occurred that will illustrate my point. It was not a big case, in that it did not involve a huge sum or time loss to the war effort. It was, however, typical of the "little" things that do hamper a nation at war.

An employee, who was engaged in drilling holes through wing panels of military aircraft in a large Midwestern plant, was using Government-owned bits in his drill. These bits, though inexpensive, were difficult to obtain at that time. While working on a particular wing panel, which was in an upright position, the employee noted that upon withdrawing his drill, the bits on three occasions were broken. On the same day two other employees reported the same experience to their foreman. One of the employees recalled seeing a man working on the opposite side of the wing panel during the course of his drilling operations. The identity of this man was established and the foreman stationed himself in position where he would not be seen, but could observe the suspect. The foreman saw that as a bit protruded through the wing panel, the suspect would strike at it with a mechanic's hammer.

When interviewed by Special Agents of the FBI, who were called to the scene promptly by the foreman, the hammer-swinging suspect stated that he had intentionally destroyed the bits. He told the Special Agents that he was in a "bad mood" and had found his job distasteful. That man was fined and sentenced to six months in a Federal penal institution, but the sentence was suspended and he was placed on probation for one year.

CERTAINLY, an instance such as that just cited shows the threat to America's defense effort which can be caused by a disgruntled employee. Lazy employees also created havoc of varying degrees during the last war.

Let each of you, as patriotic citizens, report directly and immediately to the FBI any information concerning possible sabotage which may come to your attention. The FBI Laboratory and the fifty-two Field Offices of the FBI are geared to fast action when a complaint of alleged sabotage is received. Only the confidence, support, and

An engineer examines the crystalline structure of mounted pieces of metal by means of a metallograph in the FBI Laboratory, Washington, D. C.

assistance of the American citizen can enable the FBI to carry out its assigned duties. Success in these investigations will be achieved to an even greater degree with the cooperation I know we will receive from the members of the National Society of Professional Engineers.

Security is another field in which engineers can be of considerable assistance to the FBI. Experience has shown that there are very few traitors who deliberately tell secrets to a potential enemy, but there is a great many people who indulge in loose talk and carelessly broadcast details about production and production processes to the wind.

This problem is especially acute during a period of partial mobilization like the present. In an all-out war, people are apt to take more care in their statements. As responsible leaders in the industrial plants of America, professional engineers can be of great help to their government in emphasizing to fellow workers and those under their direction the necessity of maintaining the closest security in plants doing defense work.

In closing, I would like to emphasize that the engineer is in an excellent position to aid the cause of effective law enforcement in his own community and in his employment. Few professional men are so fortunate in this regard. By and large, engineers plan and build America's cities and communities and their recreational facilities. By effective community leadership, they are in an ideal position to help alleviate conditions which breed crime.—***End.***

The Author . . .

Mr. Hoover

John Edgar Hoover, chief of the G-men, is too well known to require an introduction. He was born in Washington, D. C., and graduated from the George Washington University Law School. The story of how he built the Federal Bureau of Investigation up to be the object of national pride that it now is, is well known to everyone.

At the last count, Mr. Hoover is the holder of 16 honorary degrees, (including one honorary Doctor of Science degree) from many of the nation's most prominent scholastic institutions. In addition to crime-busting, Mr. Hoover has prominently identified himself with community service projects, particularly youth work. He is on the Board of Directors of the Boys' Clubs of America, on the National Public Relations Committee of the Boy Scouts, and an Active Member of the Grand Council of the Order of DeMolay.

-An American Engineer Photo Story-

THE SUBMARINE-MAN'S ANCIENT FASCINATION

From Greased Leather Rowboats to Sleek Atomic Powered Craft, Engineers Have Helped Men Travel Under the Sea

John P. Holland, father of the modern submarine, shown with the first submarine of the U. S. Navy, the *Holland*, which he built. Picture of the New Jersey engineer and his boat was taken in 1898.

Fig. 87. -The Marine World according to the Conceptions of the Middle Ages.—"How Alexander lowered himself into the Sea in a Glass Barrel."—Miniature of a Manuscript of the Thirteenth Century, No. 11,040.—In the Burgundy Library, Brussels.

13th Century drawing shows artist's conception of the first sub. That's Alexander the Great who has descended in a glass barrel to see what's going on beneath the waves.

SOME 23 centuries ago, in 323 B.C. when Alexander the Great was reportedly unhappy because he had no worlds left to conquer, having subjugated all civilized nations to his rule, legend has it that the mighty Macedon constructed the world's first submarine by constructing a waterproof glass barrel, clambering inside, and having himself lowered beneath the waves to see what was going on.

Scholars debate whether Alexander really did become submerged in his glass barrel, but one thing is certain—the submarine is no Johnny-come-lately to the engineering world. It has 23 centuries of planning behind it.

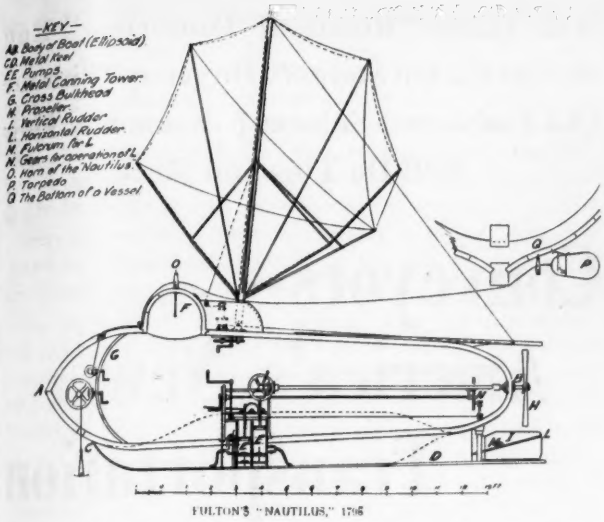
From the dawn of history and before, man has had seemingly impossible aspirations—to fly and to travel under water. Many centuries went by before either could be realized, then both became possible at about the same time. It was not by accident that they did so, for both had to await certain basic engineering developments, such as the invention of the internal combustion engine, before either an airplane or a submarine proved practical.

With the advent of the atomic submarine, an engineering miracle that promises to open the door of atomic power to other uses, the Truxtun-Decatur Naval Museum, a privately-supported institution in Washington, D. C., under the Presidency of Fleet Admiral Chester W. Nimitz, has traced the history of the submarine. In many ways it parallels the history of engineering development.

One of the earliest patrons of the submarine was King James I of England. When a Dutch inventor named Cornelis Van Dribel constructed a successful submarine rowboat in 1624, the English monarch is reliably reported to have been a passenger on an underwater trip down the Thames. The craft in which the king rode is described by contemporary engineers as an ordinary rowboat, decked over with stout, well-greased leather.

Early engineers and inventors who experimented with submarines were daring and intrepid men. In 1747 an Englishman named Symons built a submarine by decking over a rowboat. Leather bottles projected from the bottom of the craft, which, when filled with water, caused it to submerge. The submarine was brought to the surface by squeezing the water out of the bottles and tying their necks, thus increasing the buoyancy of the ship.

Another Englishman named Day built a similar boat in which he remained submerged for more than 24 hours and returned safely to the surface. Unfortunately, the inventor pressed his luck too far. Trying to repeat the experiment



FULTON'S "NAUTILUS," 1796

Robert Fulton, inventor of the steamboat, spent years working on submarines before he turned to steamboats. This is a detailed sketch of his sub, the *Nautilus*, made in 1798. The submarine worked, but would travel only two knots per hour and was rejected by Napoleon. Britain and the U. S. refused to back Fulton's submarine experiments.

with a 50 ton sloop in Plymouth Harbor, he was unable to get the craft to return to the surface and was drowned.

AN American engineer, a graduate of Yale University, made the first recorded attempt to sink an enemy warship by underwater attack. David Bushnell designed and built a pear-shaped boat named the *Turtle*. This bizarre craft was armed with a keg of gunpowder, and the operator was supposed to pedal his way out to the enemy vessel and leave the keg, with a time fuse, attached to the hull of a British vessel.

The *Turtle* submerged and surfaced with ease, and the pedal-operated screw propeller, an innovation, was highly successful. However, Bushnell was unable to work out a means of attaching his keg of gunpowder to the copper-bottomed hull of the British warship so his experiments came to nothing so far as the Revolutionary War was concerned.

One of the eminent engineers of early American history, Robert Fulton, spent many years working on the submarine. Napoleon lent him 10,000 francs to build an undersea craft for use against the British. Fulton built a successful submarine in the year 1800, but Napoleon turned it down because it would travel only two knots an hour and refused further financial aid.

In 1805 Fulton offered his submarine to the British, but they refused it because they feared that if they adopted it other nations would also with disastrous results to their fleet, then the queen of the seas. After the United States also refused to back Fulton financially, the brilliant engineer turned his attention to steamboats and gained immortality as the inventor of the first practical steamship.

THE first submarine ever to sink a ship was built by the Confederate Navy. The craft, a submersible boat named the *Hundley*, was built specifically for the purpose of destroying the Federal warship blockading the port of Charleston, S. C.

The *Hundley* sank four times, drowning a total of 40 men before it was finally successful in blowing up the Federal corvette *Housatonic* with a spar torpedo. The *Hundley* thus became the first submarine to sink an enemy vessel.

An eminent engineer, John P. Holland of Paterson, N. J., is the "father" of the modern submarine. Beginning in 1875, Holland built six boats with funds obtained by

This remarkable picture, taken through the periscope of a submarine, shows a Japanese vessel, torpedoed by an American sub, in the act of sinking. During World War II, American submarines exacted a terrible toll on Japanese shipping, sinking over three-fourths of that nation's once-proud merchant fleet.

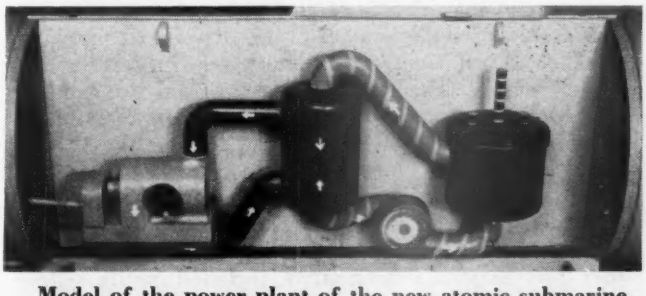
private subscription. After many experiments, Holland produced a submarine named after himself which, in 1900, was accepted by the United States Navy and became the first submarine in our history, having hull number one.

The submarine, together with engineering technology, continued to make rapid progress through the years. Its enormous potential as a weapon became apparent during World War I when Germany almost succeeded in its strategy of starving England out of the war with an undersea blockade. It was Germany's unrestricted use of submarine warfare, coupled with the sinking of the *Lusitania*, which brought the United States into World War I.

STRANGELY enough, the American submarine fleet did not succeed in sinking a single enemy vessel during that conflict and it was not until December 16, 1942, that the U.S.S. *Swordfish* received credit for the first destruction of an enemy ship, the Japanese *Atsutusan Maru*.

American submarines exacted a terrible toll on Japanese shipping in World War II, sinking more than three-fourths of that nation's once-proud merchant fleet. Submarines also played a key role in crippling Japan's navy. United States submarines accounted for 63% of all Japanese shipping tonnage lost during the war. The gallant men of the undersea service paid a stiff price, however. Forty-eight submarines never returned and 3,500 submariners lost their lives.

Today, with the snorkel "breathing" device, with atomic power, an enormously increased speed and cruising range, the submarine promises to be a key factor in any hot or cold war of the future. For better or for worse, engineers have created a formidable force in the world.— ***End.***



Model of the power plant of the new atomic submarine, which can travel farther and stay submerged far longer than any previous U-boat.

An artist's conception of the proposed Riverlake Belt Conveyor that would run across the State of Ohio.

Will These "Roads of Tomorrow" Run Across Entire States? Do Away With the Old Fashioned Subway? Some Say They Will Do This and More

Conveyors—America's New Transportation

By R. C. SOLLENBERGER

Executive Vice President, Conveyor Equipment Manufacturers' Association

THANKS to the genius of engineers and the science of engineering, conveyors seem destined to win a place in the field of the common carrier along side pipelines, truck lines, airlines, and railroads.

In my opinion, conveyors in the form of long-distance belt lines challenge today's carriers. They have demonstrated their ability to carry bulk freight at the lowest cost per ton-mile. Millions of people daily ride conveyors in the form of moving stairways so it would seem an easy step to horizontal passenger transportation.

Fantastic? Not at all. Conveyors have literally moved mountains and this seems an easy step by comparison.

As an example of what may be in store for us, let's take a look at the proposed Riverlake Belt Conveyor which its sponsors propose to have run through the State of Ohio from Lorain on Lake Erie to a southern terminal on the Ohio River, a distance of 103 miles.

Under a proposed plan, the conveyor would have twin belts, one, 54 inches wide, would carry iron ore south and a 72 inch belt to carry coal north. The savings on freight charges, over the present method of carrying by rail would be something like 26 million dollars a year.

The Riverlake Engineering Council, made up of interested manufacturing firms, has already expended well over half-a-million dollars in wrestling with the technical details of the proposed line, and its mechanical feasibility has been demonstrated beyond rational doubt.

The savings to be made on handling large volumes of freight by a conveyor belt are literally fantastic. Coal moving north to Cleveland, Akron and Lorain, for example, would cost from $1.06 to $1.50 *less per ton* than at present. Multiply the number of tons by 15 to 20 million, the expected traffic, and you immediately run into a substantial saving. The lessened cost on iron ore moving south would average something more than 50¢ a ton. That's still a substantial savings—something like 10 million dollars a year.

The impact of this new type of transportation would be tremendous. The steel industry of Ohio, for instance is troubled with high transportation charges for ore, coal and other raw materials necessarily included in its selling price. The land-locked steel mills of the Buckeye State cannot compete on even terms with mills who receive their materials by waterborne freight. If the conveyor system described could reduce their shipping costs, then the Ohio steel industry would be in a more favorable position and consumers over the entire nation would profit.

ANOTHER extremely interesting example of what may lie ahead in conveyor-transportation is the man-carrying belt conceived by Colonel S. H. Bingham, Chairman of New York City's Board of Transportation, as a possible substitute for the New York Times Square shuttle subway. It would haul 32,700 people an hour on a 2,000 foot system. Boarding passengers would step on a belt moving 1.5 miles per hour, and enter cars going at the same rate of speed. Once past the loading zone, the cars would speed up to 15 miles per hour.

The Riverlake Project has been temporarily stalemated by the refusal of the Ohio legislature, to give it the power of eminent domain necessary to acquire a right-of-way across the state. However, the real merits of the program

Here in action at Ontario, Canada, is Link-Belt equipment for handling coal from ship to storage pile.

are such that it would seem that the grant must be made eventually.

Engineers, particularly members of the National Society of Professional Engineers may be interested in a few of the details of the proposed project. Whatever the outcome of the struggle in the Ohio legislature, the possibilities of the project are enough to stagger the imagination and to be of interest to professional engineers.

Here are some of the positive and negative points revealed by an exhaustive study of the proposed long-distance conveyor system:

On the negative side, it is clear that a long distance belt can never replace the railroads or other carriers for general haulage purposes. So far, at least, conveyor belts have not been designed to handle mixed cargo profitably. Another limitation to conveyors is that they must be loaded near capacity at all times to break even economically. The Riverlake Project, for example, would have to carry almost 60% of its maximum capacity to break even. This characteristic limits most long-distance conveyor belts to places where a continuous, heavy tonnage of some material like coal or ore can be assured.

One other limitation to long-distance conveyor belts which has not yet been eliminated, (but which we believe engineering resourcefulness can someday overcome), is that of breakage. On the Riverlake Project, to continue our example, coal would change belts at least 178 times. Degradation (breakage) might destroy part of its usefulness. How much degradation would there be? Nobody knows. But one thing that might be borne in mind is a test run at a coal mine in western Pennsylvania. Two dozen eggs in grocery store cartons were put on a four-and-a-half-mile long conveyor. When they arrived at the other end after changing belts 18 times, one box was intact, and only five eggs of the dozen were broken in the other.

The advantages of long-distance conveyors like that proposed at Riverlake are clear. They are two: (1) the project is mechanically and technically feasible, and (2) it is far more economical than transportation systems now in use for the moving of bulk materials.

This article, however, has a scope wider than just the debating of the merits of the long-distance conveyor. It is to acquaint readers of the AMERICAN ENGINEER who are not in the materials handling field with the extent to which the relatively new conveyor industry has gone.

In the last decade we have seen materials handling equipment developed beyond the capacity of human musoles. I think we have now come to a point where the controls of that equipment have gone beyond the human brain.

THAT may sound like a joke but I don't think it really is. I recently had the opportunity of going into a new automobile assembly plant where all assembly lines were coordinated by electronic control, simply because manual controls were not precise enough nor quick enough. They couldn't do the job manually. These electric brains in this plant are now operating the assembly departments; they are operating gauge and inspection operations; they even protect the employees from accidents; they sort and count cards in fractions of time that it would take humans to do that same job.

For instance, they have an electric automatic sorting machine that enables them to produce fourteen thousand combinations of body trim color, and so on, on different cards. This electronic sorting machine will sort six thousand cards per hour, with an average of sixty calculations performed on each card.

In the final assembly line you find seventeen conveyors

Logs are carried by this overhead conveyor from a pond to a Lewiston, Idaho, veneer plant.

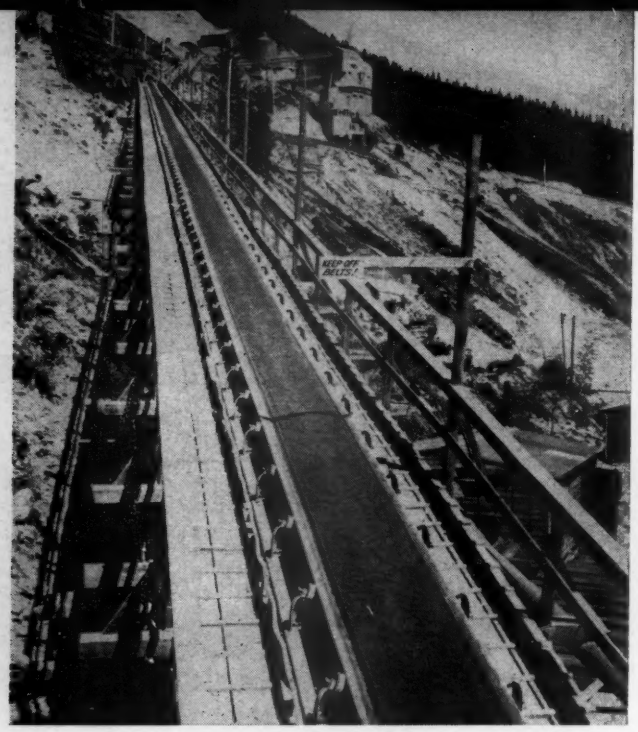
which make use of almost fifteen thousand feet of chain. There are seven hundred thousand pounds of chain on the job which could fill twelve railroad cars. When the lines are filled there are two hundred cars on them.

In the electrical control of that particular system there are one hundred and sixty miles of wiring, over six thousand electrical connections, twenty-five hundred electrical terminals, and two hundred and twenty-five pushbutton stations and two hundred indicating lights. This system not only tells you when trouble occurs, it tells you exactly where it is. Every unit on that line is double motored so they can switch from one to another in case something fails.

Conveyors play an amazing role in the life of the average person and in the normal production cycle. The uninformed are constantly amazed by it. Consider, for example, the fact that every time anything is touched, lifted or moved in the manufacturing process by a human hand, that something has been added to the cost of the finished product and nothing has been added to its value.

Much of the development that came in the field of materials handling, and conveyors especially, came as a result of World War II. General Sherman's classic defini-

At the rate of 1140 long tons per hour, overburden and ore on the Mesabi Range are carried by this belt conveyor. The system is a mile long and the belt travels at 500 feet per minute.



One and one-third miles of belt conveyors were used during the construction of Hungry Horse Dam in Montana. This one carried aggregates and sand up a mountainside to a concrete mining plant.

tion of war still holds, but one thing must be said for it. War stimulates inventive and creative thought to a degree otherwise impossible. During war, the question is: "Will it get the material to the front more quickly—never mind the cost." In peacetime, the workings of competition are such that the most economical method of doing an operation is usually paramount.

The upshot of this is that during World War II the conveyor industry took forward strides with seven league boots. The range of conveyor applications that was developed to move materials from one spot to another was truly amazing in the full sense of that overworked word.

Conveyors were built to carry single sheets of paper, and carry them the hard way—on edge. Conveyors also carried heavy bombers and heavy tanks to the final assembly lines. This is about as great a range as anybody could want. Until World War II, not even the engineering profession appreciated the great savings of time and precious manpower that could be made by substituting the conveyor for human muscles.

It is estimated that over 30% of the total cost on the average manufacturing operation comes from the handling of materials. Conveyor engineers have discovered at least seven advantages in the full use of conveyors.

What are they? Result No. 1, increased individual productivity, which cuts unit labor costs. When work is definitely delivered and taken away at a constant rate of speed and at a convenient and uniform height, the worker develops a rhythmic pace which is the pace of production of the whole plant. Operating at the pace of the plant as a whole, conveyors can take products through heat zones, cold zones, and paint or chemical zones where men cannot go. Work is safer and easier, fatigue is less and output soars.

RESULT No. 2, less wastage from human error. The mechanical conveyor permits no variation or error in the correct time required for heating, for cooking, for cooling, washing, or drying. It achieves correct dipping consistently. It assures proper order of assembly. It provides fast and accurate delivery of small tools and parts. As a result, rejects are fewer, material and time is saved, and quality is uniformly high.

Result No. 3, fewer accidents. Lifting with a bent back is one of the major causes of disabling injuries. The fewer times a man has to lift, get his fingers in the way, climb stairs, or even be near something dangerous, the safer he is, the fewer accidents and the lower accidents and insurance costs.

Result No. 4, lower inventory costs. Conveyors cut the amount of materials in process to a minimum by pacing the output of components at the exact rate required for even continuous flow into the assembly process. When batch type operations, and the consequent bank of stock are necessary, conveyors can reduce handling by providing storage while the product is actually moving into the next stage of production, or by providing fixed-point storage from which component parts can be withdrawn quickly and easily. Live storage has the added advantage of never disturbing the overall timing of the plant and of delivering materials in the right amounts, at the right time, and at the proper work level.

Result No. 5, space saving. Valuable floor space is saved by making use of ceilings for carrying in-process materials from one work point to the next. Otherwise wasted ceiling space also serves for moving stockpiles. Conveyors make possible the use of hitherto inefficient space, in buildings far apart or difficult of access by other means. It's easier to plan a new building with the ideal space layout. With a conveyor installation, difficult existing space can be used efficiently.

Result No. 6, more efficient production engineering. With an existing conveyor installation, it's easy to see work in process all along the line and to actually see stock piling up. It shows where men can be spared and where more personnel is needed. Conveyors provide a positive visual means of analyzing the manufacturing process as a whole and of quickly correcting errors in timing and flow.

Result No. 7, lower costs in scheduling operations. When a plant turns out a regular, controllable amount each day, week or year, everybody's work is regularized and simplified. Salesmen can promise deliveries with assurance. Shipments, billings, receivables, advertising release dates, vacation schedules and hiring rates, planning of new capacity and all the complex business aspects of modern industry can be dealt with in an orderly efficient manner.

Some of the uses for conveyors are really right out of this world—to employ a cliche. Take, for example, the problem of the City of Seattle, Washington in the late '20s. The City Fathers had the headache of getting rid of a small mountain—literally. The oversize hill squatted between the business and residential sections of the city and con-

(*Continued on page* 31)

The Author . . .

Mr. Sollenberger

R. C. Sollenberger, Executive Vice President of the Conveyor Equipment Manufacturers' Association, is a member of the American Society of Mechanical Engineers and has served in a wide variety of engineering executive positions both in industry and government.

During World War II, he was Chief of the Conveyor and Mechanical Power Transmission Section of the War Production Board and was Deputy Chief of the Materials Handling Equipment Branch. He is a member of the Advisory Council on Federal Reports. He is Chairman of ASME's Subcommittee on Nomenclature and Definition of its materials Handling Division.

Maintaining An Adequate Teaching Staff

How We Use the Industrial Professorship Plan

Oklahoma Tech Either Has To Reduce the Quality of Its Training Or More Efficiently Utilize Available Talent—It Will Do the Latter

By DOCTOR CLARK A. DUNN
Professor of Civil Engineering and Director, Division of Engineering, Oklahoma Institute of Technology

EDUCATIONAL institutions today are in somewhat the same situation as the young man who wired home, "I am without funds or friends," and received the answer: "Make friends!" The problems of engineering education can and will be solved, but they require more of administrators than "wiring for money."

The Oklahoma Institute of Technology at Oklahoma A & M College, like many of her sister institutions, is investing considerable effort in analyzing these problems evolving from rising costs and inadequate revenue. Among the number of specific programs which have resulted from this effort is the Distinguished Industrial Professorship plan, described later in this article.

As a state institution, it would be easy for us to say, "When we receive the necessary appropriation, we will solve our problems." But will money alone provide an adequate solution?

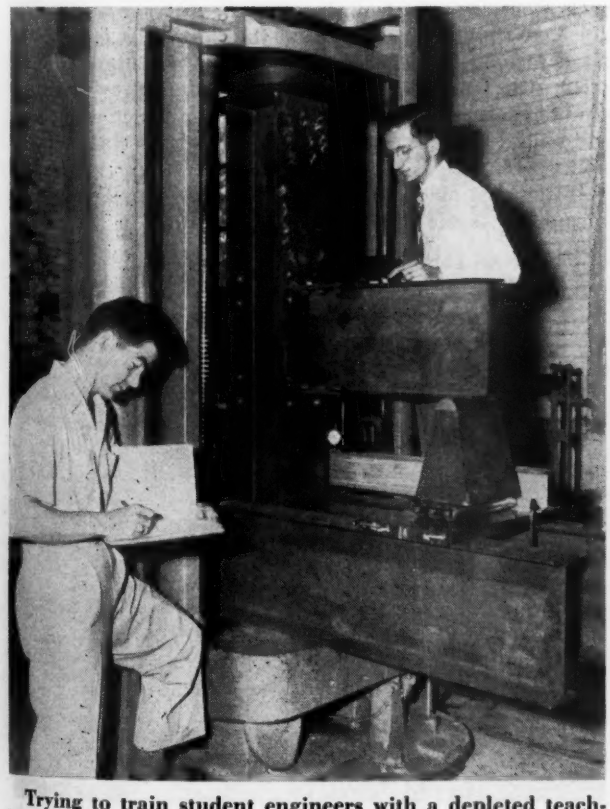
The OIT administration believes that an institution of engineering education can obtain sufficient funds if it has a well-planned, imaginative program of resident and extension instruction and research. Education is a paying investment, and the better the quality, the higher the return on the money. This fact is well recognized by industry which invests in education through fellowships, grants-in-aid, sponsorship of research, and so on.

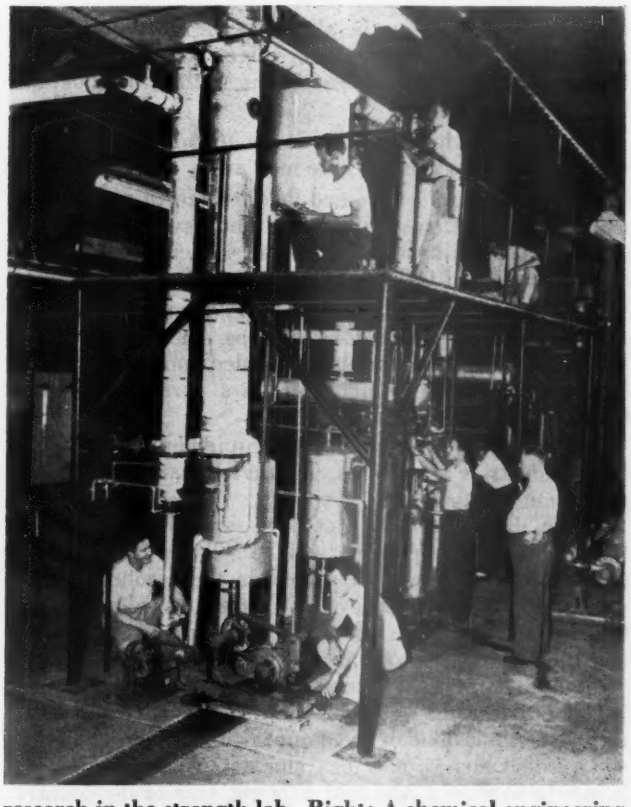
By far the gravest problem faced by this institution is that of maintaining adequate staff.

As everyone must be quite aware by now, there is an acute shortage of engineers in this country at the present time. Whatever the cause, the result is that a critical situation in the supply of engineering talent has developed.

The OIT, as is typical of all such institutions, found itself placed in the quixotic position of training desperately needed engineers with a staff heavily depleted as a result of this same need. For example, from a faculty of 140 in 1951, approximately 17 professors left OIT to accept industrial positions. And all of this was in consequence of the shortage which the institute was expected to aid in alleviating by training increasing numbers of engineers.

The OIT administration was forced to the conclusion





Trying to train student engineers with a depleted teaching staff became such a problem that OIT had to do something about it. Here students (left) work on structural research in the strength lab. Right: A chemical engineering class at the Institute.

that there were only two possible alternatives—either the quality of engineering training must be lowered or new methods must be found which would more efficiently utilize the available talent. It was naturally toward this latter goal that a great deal of careful thought was directed.

As a result of this line of thinking, the idea of the Distinguished Industrial Professorship plan was conceived. According to this plan, the Oklahoma Institute of Technology is proposing to recruit for research and instruction, at this time, a maximum of five outstanding engineers who are near retirement or who have retired from industrial positions.

It was felt that valuable engineering talent and experience is being wasted through enforcement of arbitrary retirement ages by many companies. Age alone cannot be used to measure a man's potential productive capacities—Benjamin Franklin was in his seventies when he took an active part in creating and guiding this nation; George Bernard Shaw contributed much in the fields of drama and criticism after 65; a number of men prominent on our national scene—Vice President Alben Barkley, former President Herbert Hoover, General Douglas MacArthur, and Bernard Baruch, to cite a few—are well into their eighth decade.

It is not expected that a great number of men will qualify for the OIT professorships, since they will be selected for particular positions and for specific technical experience and abilities. Each person so employed would be individually considered. His duties and responsibilities are to be outlined in accordance with his industrial background, his personal wishes and his physical and mental condition. The Distinguished Industrialist will be given a flexible working schedule with allowance for part-time activity in order that independent consulting work can be carried on by the professor, if he desires.

OIT is particularly interested in securing the type of man who can outline and carry out a new program. Not only will the professors be allowed wide freedom in their work, with emphasis on the creative, but they will also have the opportunity of associating with ambitious and able young people.

The factors which have been set up for primary consideration in selection of these men are:

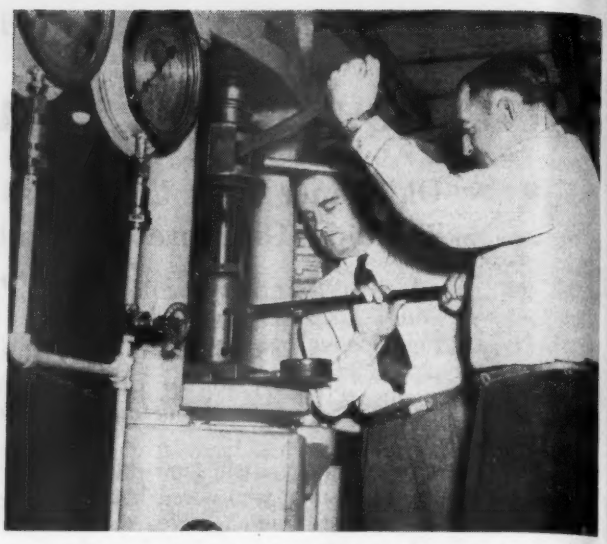
Need for man in a specified field, record of accomplishment of the man, present physical and psychological condition, acceptability to regular staff in school concerned, and suitability of Oklahoma conditions to man.

In a brochure issued by the OIT describing the Distinguished Industrial Professorships, the heads of the various engineering schools have listed some of the fields of specialization for which there is a particular need in Oklahoma. These include:

Corrosion, electric power, farm equipment, highway design, industrial electronics, industrial management, and petroleum equipment.

These illustrations do not necessarily limit the fields from which the applicants will be selected. However, a definite limitation will be placed on the number of individuals who will be employed. We feel it would be unfair to bring a large number of men to the campus at one time, and then have the program fail because ample assistance could not be provided to make this a workable program.

Of course, some obstacles to this plan have presented themselves, but none of them appear insurmountable. Possibly, some men would be reluctant to leave long-time homes to work in a new and different area of the country. Some concern was felt about the effect the professorships might have on tenure and advancement for the regular staff, but these difficulties we believe have been overcome.



A research project at OIT in highway design.

The Distinguished Industrial Professorship program is only one of several plans which are attracting and retaining outstanding engineering talent for the OIT staff. But underlying all of these plans is the basic belief that the addition of many people to the faculty will not be equivalent to one person of superior capabilities. A simple illustration of this principle might be drawn from welding. If two pieces of steel are to be welded together, a huge bonfire may be built, but the weld cannot be made without an intense concentration of heat at one small point. The superior engineer supplies the intense concentration of talent which can weld a strong educational program.

The Distinguished Industrial Professorship and other such plans have been designed to provide immediate relief from our faculty problem. In addition, a critical analysis of the situation reveals that certain matters of long-range policy must be considered in order to maintain the kind of engineering educational program which we believe is essential to the economic well-being of our state and nation.

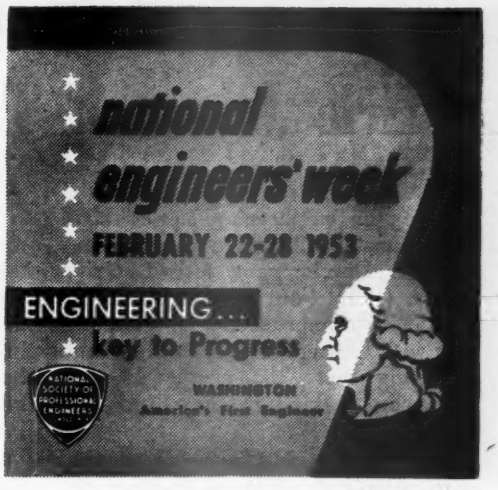
In the first place, an important factor which should be considered is the amount of specialization in the under-

(*Continued on page* 21)

OIT is well equipped. Here is some photo-elasticity equipment.

Better Than Ever . . .

'53 Engineers' Week Promotional Work Begins; Kits Ready Oct. 1



"THIS present Indian Summer weather might make chill February seem a long ways off, but when we think of time in terms of how much work has to be done preparing for our celebration of National Engineers' Week, February 22-28, 1953, we have few hours to lose," W. W. Perry, National Engineers' Week Committee Chairman for a second year, said recently.

"Last year the amount of excellent public relations and effective publicity gained for the profession should be enough to make all of us ready to work harder than ever for a great Week in '53."

In a letter to all State Presidents requesting the name of the State Chairman in each Society, Mr. Perry asked that preparations start now at the State and Chapter level as well as at the National level.

It has been announced that the popular Engineer's Week Promotion Kits will again be distributed to all States and Chapters this year. The Kits, containing many promotional aids and ideas, will be sent out between October 1 and 15. Kits will be sent directly to State and Chapter officials who have been asked to pass them along to the men who will be in direct charge of the Week's activities.

Radio and TV Shows

Work has also begun at the National level on new radio and TV shows for State and Chapter use. A new fifteen-minute radio program recorded on tape will be offered in the near future. The radio program, produced and recorded by professionals, and guaranteed to be of the finest broadcast quality, will use the voices of three of the Nation's outstanding engineers. The program will be built around the theme of the profession's value to the welfare of America.

Also to be offered at cost price will be a 2-minute TV film strip that can be used by local stations by the States and Chapters. This film strip will feature an outstanding engineer using models and other visual aids to portray the engineer's contribution to our daily living.

Full information concerning the radio and TV shows will be released shortly.

Industry Contacts

The Nation's industry will be contacted again this year. Material will be sent out to all leading firms offering them promotional aids.

The press, radio and TV industries will be supplied with all appropriate information throughout the weeks before the February celebration. Leading radio and TV advertisers will be asked to mention the Week on their national programs.

"We plan an extensive program to call the public's attention to the accomplishments of the engineer. Our theme this year is 'Engineering . . . Key to Progress,' and we want to do everything possible to make our citizens aware of this theme," Mr. Perry said.

The 1953 seal is reproduced above. It will be used on gummed labels to be affixed to letters, etc., as a large poster for window displays, and so forth.

The following men from the State Societies have been selected to guide Engineers' Week activities in their States. All Societies not listed should notify National Headquarters now of the men who will lead their programs.

Alabama

John E. Conn, Jr., P. E.
201 First Street
Chickasaw, Alabama

R. H. Pogue, Jr., P. E.
Post Office Box 552
Birmingham, Alabama

Arizona

Vic H. Housholder, P. E.
Post Office Box 5278
Phoenix, Arizona

Arkansas

R. J. Rhinehart, P. E.
411 Main Street
Pine Bluff, Arkansas

Colorado

Gilbert B. Carter, P. E.
3300 South Bellaire Street
Denver 3, Colorado

Robert F. McKee, P. E.
20 East 9th Avenue
Denver, Colorado

Connecticut

Henri B. Van Zelm, P. E.
179 Asylum Street
Hartford, Connecticut

Florida

Jules Channing, P. E.
1575 Washington Avenue
Miami Beach, Florida

Georgia

C. T. Baker, P. E.
1070 Spring Street, N. W.
Atlanta, Georgia

William C. Cram, Jr., P. E.
231 West Paces Ferry Road, N. E.
Atlanta 5, Georgia

Dr. H. S. Weber
Director of the School of Mechanical Engineering
Institute of Technology
Atlanta, Georgia

(*Continued on page* 21)

Engineers Are Statesmen

Eric Johnston Talks at NSPE Dinner-Meeting

Using an engineering simile, Mr. Eric Johnston, Chairman of the International Development Advisory Board, (Point Four) told his hearers at NSPE's dinner-meeting in connection with Chicago's Centennial of Engineering that "the people of the world are seeking a new world design."

"Two great and powerful firms with completely different theories of social engineering, are bidding for the job," Mr. Johnston declared. "On the one hand is the firm of USA and Associates, which contends that a durable edifice of world peace and prosperity can only be built to specifications of political and economic freedom, equal justice for all, and the integrity of the individual.

"On the other hand is the firm of Communism International which promises—no matter how falsely—that a decent world can be built to specifications of dialectic materialism, with specifications of force, suppression and abasement of the individual."

"The decision as to which of these designs is finally to be accepted rests ultimately with those peoples of the world who are still free to make a choice.

"We have taken effective steps to prevent our competitors from using force and intimidation to compel acceptance of their plan. We have done much—but perhaps not enough to expose and discredit their abortive promises and mis-leading double-talk.

"But we still have the enormous job of explaining and interpreting our own blue-print to the billion or so people, who, in the end, are going to decide what kind of a world they want to live in," Mr. Johnston declared.

"Diplomacy has entered a new dimension," Mr. Johnston told the assembled NSPE members and guests. "It has moved out of the gilded conference rooms of world capitals and into tents on the deserts of Iraq and Saudi Arabia; into mud-walled villages on the high central plateau of Iran and the plains of India; into cocoa groves along the Kpo River of Liberia and into rice paddies along the Irriwaddy in Burma; into the cold, thin air of the high Andes and the hot, thick atmosphere of the Amazon Basin. . . .

"Our present day diplomats [editor's note: engineers and technicians] take less pleasure from the marble fountain in a formal garden than from the sinking of a tube well or the filling of an irrigation ditch. The map he pores over shows not the area of a boundary dispute but the track of an invasion of locusts. His dispatch case, instead of *aides memoires,* carries charts on a minerals survey, or engineering plans for a power project, or blue-prints for a new factory.

"The American people feel at ease in this new dimension of diplomacy. There are several good reasons for that. Helping people to help themselves is in the American tradition.

"There is no question that, as a whole, the world has resources sufficient to enable all mankind to enjoy a high standard of living. And there is no question that human knowledge and skill are sufficiently advanced to use the riches of the earth for the general good.

"In the free world there are roughly 1.4 billion other people, outside the United States, whose needs must be considered; nearly 400 million are in those countries we call more developed, over a billion are in those we call less developed.

"If you ask me what less developed means, I will tell you it means far short of the potential of productivity and development based on physical and human resources. It means a lag of decades and even of centuries behind the norms established by ourselves and other more developed nations of the world.

"It means that this acre of land which has produced 10 bushels of grain with primitive methods can be made to produce 20 or 30 or 40 with modern techniques and less human effort. It means that this arid valley can support lush farms and that bleak range of mountains can supply the ingredients of heavy industry.

"The so-called underdeveloped areas are veritable storehouses of dormant wealth. But the inhabitants of these areas mean to enrich their own lives from their own inheritances. In other words, the fulfillment of our needs is not something we can achieve unilaterally. Our diplomacy from now on must have as its purpose—and as its result—the reaching of mutually advantageous objectives by partnership arrangements carried out by mutual agreement. That is the significance of the new dimension in diplomacy. That is the Point Four method. It is the only method that will work now that the peoples of the earth are demanding independence and decent conditions of life.

"But Point Four is more than this—much more. It is the vehicle for a new kind of industrial statesmanship, through which the forces that built America can be employed to help build modern economic structures in countries that still lag centuries behind. It is the projection of our system of private enterprise into global focus, calling into play as instruments of foreign policy the brains and brawn, the imagination and practical experience of our industry.

"Too few people realize this in America. Too many think Point Four is just another 'Government give-away' program. Too many people think it is global do-gooding. Too few realize that Point Four depends on the investment of private capital to achieve real economic progress in the countries less fortunate than our own.

"It is necessary to be realistic about this matter of private investment abroad. There are difficulties galore. One of my staff recently made a list of 35 deterrents to the flow of American capital abroad, and I daresay his list was incomplete. It included only the main problems—risk of nationalization, barriers to exchange convertibility, tax discrimination and others. . .

"Every possible effort is being made by the Government of the United States, through its various agencies to eliminate these obstacles...

"Now time and again I hear it said that there is no use talking to American capital about our moral responsibility toward the less developed countries of the free world. American capital, I am told, is not interested in moral obligations—it is interested only in one thing—profits. But that is only partly true. Our system is a profit system, but American industry has more than once shown its willingness to share the burden of any undertaking we may have found it necessary to assume in the national interest. . .

"I have confidence that, given the proper encouragement, it will do so in this instance."

Counselors Selected By Society Committee

Specialization in Engineering has brought with it an increasing desire by Student Engineers, Engineers-in-Training and young Professional Engineers to obtain orientation advice from well-established Professional Engineers.

A way appears to have been found to meet this need, at least in part.

A number of well-established Professional Engineer members of the National Society of Professional Engineers have agreed to receive written requests for orientation information from Student Engineers, Engineers-in-Training and young Professional Engineers and to answer these requests, to the best of their ability, by mail.

This service is not intended to be an employment service. It is intended to be a counselor service on orientation problems of young engineers.

The well-established Professional Engineers who have volunteered for this orientation information service are listed alphabetically, by states or the equivalent, in the tabulation which follows.

Young Engineers Committee
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

ARIZONA

Robert L. Anderson
1522 West Vernon
Phoenix

Prof. Davis Bartholomew
2532 East Drachman St.
Tucson

Walter H. Croft
Box 2591
Central Arizona Light & Power Co.
Phoenix

W. T. Hamlyn
812 Security Building
Phoenix

James E. Hastain
1114 North 7th St.
Phoenix

Gerald W. Irvin
P. O. Drawer 57
Sahuarita

Fred H. Jobusch
450 North Sixth Ave.
Tucson

Arthur S. Mann
80 South Stone Ave.
Tucson

Roger I. C. Manning
235 W. Bethany Home Road
Phoenix

Benjamin McLain
118 West Washington St.
Tucson

Clifford C. Sawyer
11 West Adams St.
Phoenix

John H. Stufflebean
155 West Pennington St.
Tucson

ARKANSAS

William F. Beckman
Beckman & Word Construction Co.
P. O. Box 7, Station B

W. D. Cobb
Fort Smith
P. O. Box 401
Blytheville

Marion L. Crist
Union Life Building
Little Rock

Harold J. Engstrom
Arkansas Foundry Co.
P. O. Box 909
Little Rock

W. G. Huxtable
P. O. Box 486
West Memphis

George H. Scott
318 Engineering Hall
University of Arkansas
Fayetteville

George W. Swilley
602 Wesson St.
El Dorado

Raymond W. Toler, Jr.
3305 Poplar St.
Pine Bluff

CALIFORNIA

Raymond Archibald
2227 Lombard St.
San Francisco 23

Paul V. Birmingham
928 Clintonia Ave.
San Jose 10

A. C. Bullen
1985 23rd Ave.
San Francisco 16

Harold W. Burney
Preço, Inc.
Los Angeles

O. E. Deatsch
Rt. 6—1436
Modesto

William P. Field
1045 Ridgewood St.
Long Beach 7

Kenneth D. Harrington
10343 East Schmidt Road
El Monte

C. M. Helm
2132 Stacia Way
Sacramento 18

Donald S. Preneveille
4001 Woodruff Ave.
Oakland 2

Otis R. H. Roberts
27100 Dapple Gray Lane
Rt. 2, Rolling Hills

Victor J. Van Lint
P. O. Box 413
San Bernardino

Dr. Felix A. Wallace
College of Pacific
Stadium Dr. & Pacific Ave.
Stockton

COLORADO

Carl E. Dahlquist
1035 Sherman St.
Denver

George C. Hahn
1720 California St.
Denver

K. A. Heron
2000 South Acoma St.
Denver

Harry A. Moore
P. O. Box 270
Colorado Springs

Irvin S. Rasmusson
Boston Building
Denver

L. M. Robertson
Public Service Co. of Colorado
Denver

A. Warren Simonds
Denver Federal Center
Denver

Kenyon C. Vail
1834 Monaco Boulevard
Denver

Arthur F. Weers
1150 Jackson St.
Denver

CONNECTICUT

Joseph F. Barba
57 Grandview Ave.
Hamden

Aloysius E. Cooke
68 Norton St.
New Haven 11

Louis Lichtenstein
23 Elder St.
Milford

William J. Moore
146 Green Road
P. O. Box 155, Station A
Manchester

George L. Mylchreest
238 Palm St.
Hartford 12

Edward J. Nesbitt
Bauer Place
Westport

Llewelyn Morton Reed
42 Florence Ave.
Devon

James D. Skinner
460 Old Oaks Road
Bridgeport 4,

DISTRICT OF COLUMBIA

J. I. Ellman
1420 New York Ave., N.W.
Washington 5

P. F. Harper
Potomac Electric Power Co.
10th & E Sts., N.W.
Washington

John R. Williams
c/o Johnson & Williams
1225 19th St., N.W.
Washington 6

FLORIDA

Forrest D. Banning
3318 Dinner Key Drive
Miami 33

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DeLand

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P. O. Box 56
University Branch
Miami 46

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Tallahassee

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Dean Joseph Weil
University of Florida
Gainesville

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John W. Flatt
1109 North Jackson St.
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Raymond J. Gauger
Campbell Building
Augusta

Laurence S. Miller
P. O. Box 250
Brunswick

John W. Oxford, Jr.
P. O. Box 158
Griffin

Ralph F. Rhodes
5 East 55th St.
Savannah

G. J. Tankersley
Gas & Light Co. of Columbus
Columbus

Prof. Donald B. Wilcox
Georgia Institute of Technology
Atlanta

Thomas H. Winchester
Bankers Insurance Bldg.
Macon

IDAHO

Raymond J. Briggs
619 Grove St.
Boise

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State Public Health Engineer
Dept. of Public Health
Boise

Henry F. Gauss
University of Idaho
Moscow

L. M. Huggins
1621 Mt. View Drive
Boise

William P. Hughes
City Engineer
City Hall
Lewiston

Ray S. Hunter
346 North Arthur
Pocatello

J. Hugo Johnson
University of Idaho
Moscow

Mark R. Kulp
107 State House
Boise

R. M. Parsons
818 Foster Ave.
Coeur d'Alene

INDIANA

Samuel E. Brownsten
6636 Forest Ave.
Hammond

L. E. Easley
6511 Evanston Ave.
Indianapolis 20

J. C. Ferguson
2301 Florida Drive
Fort Wayne 3

Lews S. Finch
Box 855
Indianapolis

N. E. Gunderson
1438 Lincoln Way East
Mishawaka

Dean A. A. Potter
517 Russell St.
West Lafayette

Dean Karl E. Schoenherr
College of Engineering
University of Notre Dame
Notre Dame

Prof. Harry L. Solberg
School of Mechanical Engineering
Purdue University
Lafayette

KANSAS

J. O. Armstrong
City Hall
Kansas City

Edgar S. Colvin
1726 Washburn
Topeka

Prof. Leland S. Hobson
Kansas State College
Manhattan

Arthur E. Inman
1407 Broadway
Parsons

Seth P. Kingman
118½ Grant Ave.
Garden City

C. H. Scholer
Kansas State College
Manhattan

C. Y. Thomas
Spencer Chemical Co.
Pittsburg

C. V. Waddington
Box 208
Wichita 1

Murray A. Wilson
P. O. Box 937
Salina

MARYLAND

Paul W. Backhus
2023 Maryland Ave.
Baltimore

Arthur M. Gompf
1019 North Calvert St.
Baltimore 2

Robert E. Morris
Apartment 108
106 Schuyler Road
Silver Spring

A. L. Penniman, Jr.
2009 Lexington Building
Baltimore 1

Gustav J. Requardt
1304 St. Paul St.
Baltimore 2

Van Rensselaer P. Saxe
1701 St. Paul St.
Baltimore 2

MICHIGAN

Fred R. Cheek
450 Elizabeth
Dearborn

Otto H. Hall
1414 Sunnyside
Lansing 10

Prof. Hugh E. Keeler
West Engineering Bldg.
University of Michigan
Ann Arbor

Dudley Newton
Civil Engineering Dept.
Wayne University
Detroit 1

L. J. Richards
1106 West Sugnet Road
Midland

Stephen G. Szabo
11-148 General Motors Bldg.
Detroit 2

Donald E. Trefry
1911 First St., Rm. 102
Detroit 26

MINNESOTA

C. W. Britzius
Route 4
Wayzata

Paul V. Burgett
"C" Fayal Ave.
Eveleth

B. H. Clingerman
715 West Minnehaha Parkway
Minneapolis 19

Charles E. Doell
325 City Hall
Minneapolis

Arndt J. Duvall
1391 Fairmount Ave.
St. Paul 5

LeRoy A. Griffith
3657 38th Ave., S.
Minneapolis

Frederick F. Heisel
124 East Alcott
Fergus Falls

George O. Pierce
School of Public Health
University of Minnesota
Minneapolis 14

N. T. Rykken
915 Grandview Ave.
Duluth 5

T. W. Thomas
2075 Juno Ave.
St. Paul 5

T. S. Thompson
1246 University Ave.
St. Paul

Thomas H. Wall
721 15th St., N.E.
Rochester

Michael P. Walle
3230 Second Ave., West
Hibbing

MISSOURI

C. H. Ax
6237 Southwood Ave.
St. Louis 5

W. E. Bryan
4359 Lindell Boulevard
St. Louis 8

C. M. Lytle
P. O. Box 679
Kansas City 10

Claude P. Owens
1223 Elmerine
Jefferson City

Charles C. Redman, Jr.
P. O. Box 62
Kennett

R. E. Riddle, Sr.
1406 Dewey Ave.
St. Joseph

William M. Spann
1207 Grant Ave.
Kansas City 6

Joe Williamson, Jr.
c/o Russell & Axon
408 Olive St.
St. Louis 2

Bruce Williams
The Bruce Williams Laboratories
P. O. Box 552
Joplin

NEW JERSEY

Fred S. Childs
69 Blue Lane
Clifton

George D. Hays
646 Prospect St.
Westfield

Guy Kelcey
E. William St.
Newark 2

Frederick Kraissl, Jr.
299 Williams Ave.
Hackensack

Harry F. Labecque
17 Linden Place
Red Bank

James Logan
Mount Holly

Malcolm J. Macfarlane
626 Pavonia Ave.
Jersey City

Horace M. Patrick
20 Olcott Ave.
Bernardsville

Joseph Rosenthal
530 Hamilton Road
South Orange

Walter W. Slocum
744 Broad St.
Newark 2

Albert L. Stubee
531 East Commerce St.
Bridgeton

S. Herbert Taylor
712 Elmer St.
Vineland

Elmer S. Tuthill
100 Summit Ave.
Summit

NEW MEXICO

Charles E. Barnhart
2722 Hyder Drive
Albuquerque

Ray Foss
Civil Engineering Dept.
The University of New Mexico
Albuquerque

E. R. Harrington
223 North Cedar St.
Albuquerque

Gordon E. Herkenhiff
866 Don Cubero
Santa Fe

Charles L. Knaus
640 Galisteo
Santa Fe

Guy V. Martin
1415 East Roma Ave.
Albuquerque

A. S. Walter
P. O. Box 705
Socorro

NEW YORK

Phil T. Elliott
701 Winona Boulevard
Rochester 17

Newell L. Freeman
23 South Pearl St.
Albany

C. N. Metcalf
5618 Overlea Road
Washington 16, D. C.

M. H. Pratt
128 Fellows Ave.
Syracuse 10

Dr. D. B. Steinman
117 Liberty Street
New York

Arthur A. Vioni
Room 909, Municipal Bldg.
Brooklyn 2

Edwin F. Wood
1715 Lovell Terrace
Elmira

NORTH CAROLINA

J. Ward Andrews
2320 Brandon Road
Wilmington

Harry Hoffman
232 East Market St.
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H. B. Morris
1825 Gaston St.
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James F. Pou
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Charlotte

C. Bernard Scott
P. O. Box 694
Hickory

E. C. Shearon
529 South Fulton St.
Salisbury

W. T. Smith
P. O. Box 364
Siler City

William Emite Viverette
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Rocky Mount

OHIO

Robert E. Allen
1731 Auburn Ave.
Dayton 6

E. Faber Biggert
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Columbus 9

Thomas C. Dee
604 Ardleigh Drive
Akron 3

Fabert F. Fisher
118 West Stafford Ave.
Worthington

Ralph H. Greegor
2700 Tremont Road
Columbus

John F. Hale
301 Willowwood Drive
Dayton 5

Alfred Le Feber
Temple Bar Building
Cincinnati 2

James S. Linback
1107 Plum St.
Cincinnati 2

Delos M. Palmer
4401 Jackman Road
Toledo 12

Eric H. Wang
635 Probasco St.
Cincinnati 20

OKLAHOMA

W. H. Carson
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University of Oklahoma
Norman

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Clark A. Dunn
317 North Husband St.
Stillwater

Fred G. Fellows
1017 West Highland
Ponca City

Harvey G. Freehauf
120 South Main
Miami

Calvin T. Grant
State Dept. of Health
Oklahoma City

G. W. McCullough,
Vice-President
Phillips Chemical Company
Bartlesville

M. L. Power
Director of Engineering Extension
Oklahoma A&M College
Stillwater

Dean Edward R. Stapley
Oklahoma Institute of Technology
Oklahoma A&M College
Stillwater

Clarence A. Stoldt
State Highway Director
Capitol Building
Oklahoma City

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Ardmore

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12 Harper Ave.
Toronto

PENNSYLVANIA

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Scranton 3

H. Fay Diehl
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Harrisburg

Paul Evans, Jr.
P. O. Box 220
Sharon

Karl L. Gatter
Gatter & Diehl
321 North Front St.
Harrisburg

H. F. Hatfield
Pa. Power & Light Co.
901 Hamilton St.
Allentown

Robert L. John
607 9th Ave.
Patterson Heights
Beaver Falls

William O. Land
55 North Highland Ave.
Norristown

Bert W. McDowell
210 West 37th St.
Erie

Edward Ott
1536 Garfield Ave.
Wyomissing

John R. Smith
302 State Hall
University of Pittsburgh
Pittsburgh 13

M. Joseph Truscott
1321 Arch St.
Philadelphia 7

TEXAS

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171 Engineering Building
University Station
Austin 12

B. P. Harrison
2121 Commerce Bldg.
Houston 2

Martin C. Hughes
Electrical Engineering Dept.
A&M College of Texas
College Station

Glenn C. Hunt
1519 Transit Tower
San Antonio

H. L. Roberts
P. O. Box 465
Corsicana

Sylvan B. Schapiro
1818 Church St.
Galveston

Lt. Col. Uel Stephens, USAR
2714 Greene Ave.
Forth Worth

VIRGINIA

W. R. Acker
3208 Circle Hill Road
Alexandria

Edgar B. Boynton
711 West Main
Richmond

John L. Guest
113 South 3rd St.
Richmond

Richard P. Hankins
18 North 5th St.
Richmond 19

Edward S. Holland
316 South Washington St.
Alexandria

Edwin K. Mattern
118A Campbell Ave., S.W.
Roanoke

Walter H. McCartha
2926 South Buchanan St.
Arlington 6

James E. McCoy
Bluefield College
Bluefield

John B. McGaughy
21st at Llewellyn
Norfolk 10

R. Stuart Royer
401 Virginia Bldg.
Richmond

WASHINGTON

Stephen M. Batori
605 Artic Building
Seattle 4

Peter H. Hostmark
Lloyd Building
Seattle 1

Charles F. Monson
860 Stuart Building
Seattle 1

Kenneth P. Norrie
208 Realty Building
Spokane 1

Charles V. Smith
c/o Northwest Laboratories
200 James St.
Seattle 4

Alfred K. Stillman
Chambers Building
Olympia

William M. Valentine
Mercer Schools
Seattle

Wilho E. Williams
1505 West Main St.
Spokane 9

Kendall M. Wood
Great Northwest Life Bldg.
Spokane 8

WEST VIRGINIA

Arthur K. Banks
507½ Washington St., East
Charleston

Melville D. Hensey, Jr.
212 Queen St.
Beckley

John J. Kodak
Grant Town

Alfred D. Longhouse
Head, Dept. of Agricultural Engineering
West Virginia University
Morgantown

I. A. Pitsenberger
153 Oakland Ave.
Huntington

J. T. Van Voorhis
154 Garfield Road
Clarksburg

Professorships

(*Continued from page* 16)

graduate program. This specialization means an additional cost which may not produce proportionate results. Fewer electives that result in larger classes for undergraduate training, often mean better instruction at a lower cost and a more able graduate.

A strong and practical extension program of engineering education can also play a vital role in the contributions of a professional institution. The OIT has a very active graduate extension program for engineers in industry. Ten master's degrees were granted this year to engineers who had completed this work while holding full-time jobs. Part of the work toward the Ph.D. in engineering can also be taken under this system at OIT. This type of program, which is probably offered by many institutions, produces a very healthful and stimulating interchange between the college and industry.

THESE are matters upon which ultimately depend the well-being, progress and security of our entire nation. This may best be illustrated by quoting a speech delivered by Raymond Rubicam, member of the Committee for Economic Development, at a meeting inaugurating the "Crisis in Education" campaign. Mr. Rubicam called attention to the "striking relation between national standards of education and national prosperity."

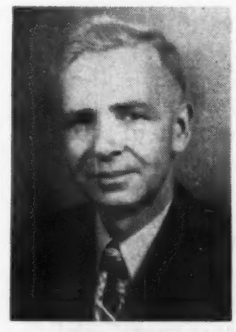
"Rumania," he pointed out, "has fertile land, ample forests, rich oil resources, good climate and rainfall—but provides a relatively small amount of education and technical training. Despite its natural advantages, Rumania has a low income level."

"Switzerland, on the other hand," he continued, "is a mountainous country, with poor soil and little land fit for cultivation, a severe climate and few minerals—but excellent education and technical training. Despite its natural disadvantages, Switzerland has an unusually high income level."

All of which means that education is an investment that pays high dividends. The individual who "begs" for assistance for an educational activity lacks appreciation of the true value of a sound educational program.

There is no question that this nation can afford a good educational program. The only question is whether we can afford a specific program. A mediocre program is expensive; a poor program is wasted money; misdirected educational effort is inexcusable. The security, progress and well-being of our nation are almost totally dependent upon the effectiveness of the education of our people.

The Author . . .



Prof. Dunn

Clark Allan Dunn, Professor of Civil Engineering and Executive Director of the Division of Engineering Research of Oklahoma Institute of Technology, has had a distinguished career in engineering, both in education and in industry.

Dr. Dunn is the holder of four academic degrees from the University of Wisconsin, Oklahoma A & M College and a doctorate from Cornell University. He is a registered engineer in Oklahoma and is Chairman of NSPE's Committee on Education. In addition to teaching, Dr. Dunn has served as a consultant to various industrial corporations and to the armed forces. He still finds time for community activities, is a member of the Stillwater Chamber of Commerce and a past President of the local Lion's club.

Names

(*Continued from page* 17)

Randolph Whitfield, P. E.
Georgia Power Company
Post Office Box 1719
Atlanta 1, Georgia

Idaho

Leigh Huggins, P. E.
1621 Mountain View Drive
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Illinois

Lee I. Osborn, P. E.
Sherrard, Illinois

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Twenty Questions and Answers . . .

WHY THE DUES INCREASE?

For some period of time the Budget Committee of NSPE has pointed out to representatives of the State Societies that many worthwhile activities which should be developed on behalf of professional engineers by NSPE cannot be accomplished because of financial limitations. The problem has increased in the past few years as NSPE has grown, attained a stature of prominence in the engineering profession, and members, local Chapters and State Societies have urged increased activities. Recently several State Societies, after studying the budget and financial income of the Society carefully, have proposed a dues increase.

Acting on a resolution from one State Society at the November, 1951, Board Meeting, the Board directed that a Special Committee present to the State Societies the financial picture of NSPE, pointing up the limitations of activities imposed by the finances available. The report of this Special Committee was transmitted to all State Societies and Chapters in March, 1952, and was completely reprinted in the April, 1952, issue of the AMERICAN ENGINEER.

The Board of Directors again considered the matter at the Annual Meeting, held June 5-7, 1952, in Tulsa, and felt that the matter was not sufficiently crystallized by the Chapters and State Societies for action at that time. They, therefore, directed the Constitution and Bylaws Committee to prepare appropriate revisions to the Bylaws for action at the forthcoming Board meeting in November in Richmond.

In order that the members may have as much information as possible on this important problem of NSPE, information follows concerning some of the more pertinent questions being asked.

?Why is a dues increase needed?

Inflation is the first reason. All of us are personally familiar with the increase in the cost of living since the War. Costs for everything for which NSPE funds are used have correspondingly increased—printing, paper, postage, transportation, salaries, etc.

Expansion of NSPE's programs and service to its members is the second reason. Important here have been increased committee activity, increased governmental and legislative liaison, additional publications, improved *American Engineer*, expanded programs for Engineers' Week, public relations, salary and fee schedules, employment practices, ethical practices, and similar activities.

?How much is the proposed increase in dues?

From the current $7.00 (adopted in 1946) to $10.00 per year.

?How much revenue will this provide?

Between $50,000 and $75,000 per year.

?Will this provide any additional services to the members?

Yes. There are many activities already authorized by the Board of Directors which cannot be accomplished because of limited funds, such as: a continuation of the public relations program ($20,000); development of an aggressive membership campaign ($10,000); provision for a third Board Meeting each year $7,500); more extensive promotion of advertising in the *American Engineer* ($5,000); annual provision for developing the financial Reserve of the Society ($15,000); more extensive Congressional and Governmental liaison on behalf of professional engineers ($5,000); development of surveys on salaries, professional education, employment conditions, and other fields on which information is needed ($12,500).

***?The NSPE is a "grass roots" organization. How will additional money directly benefit the* States *and* Chapters?**

The comprehensive results obtained at the National level are beneficial to the Society as a whole, and the prestige of each level results in prestige for the others. Specifically, it can be said that much of the work done at the National level is of direct member benefit such as legislation, salary studies, etc. National effort also results in publications, materials, etc., that are actually put to use at the local levels. Examples: Engineers' Week Promotion Kit, Executive Research Survey Reports, Legislative Policy Statements, Public Relations News Letters, etc. Additional funds would result in more membership promotional materials, radio and TV scripts for Chapters' use, more extensive distribution of the Legislative Bulletin, more useful material dealing with ethics, salary and fees, registration, young engineers, etc.

?Didn't the Special Public Relations fund provide enough money for an adequate program?

The response to the special fund was excellent. However, to attain full results of the program made possible by these contributions, a continuing program should be provided. Excellent publicity resulting from this beginning can be effective only if continued emphasis is given the program.

?Why does the Board need to meet three times a year?

NSPE's policies are determined by representatives of State Societies who, in turn, represent the members' wishes as expressed to them by Chapter representatives in the best democratic tradition. With present Board meetings spaced six months apart, review of these policies and determination of future action are not as frequent as needed to retain "grass roots" direction. Third Board meeting will permit consideration of current activities every four months.

?Will it be necessary to limit further current membership services if a dues increase is not approved?

That depends. If the cost of doing business continues to rise, some economies will have to be provided. Stringent economies have already had to be provided in the 1952 budget.

?What activities, then, are now being curtailed?

The Board of Directors has been unable to include the following activities in the 1952 budget: a third Board Meeting, a State Secretaries' Conference, a number of very important committee meetings, extensive promotional effort to secure advertising for the *American Engineer*, adequate effort toward the national observance of Engineers' Week, desirable membership activity, etc.

?Can we not secure this additional income by getting more new members?

Membership is the life blood of the organization. To attract members, however, an aggressive program is needed. It must be remembered that new members also increase costs. Of each member's dues, $2.00 covers a subscription to the *American Engineer*, and a minimum of $1.00 is utilized in the individual services and record keeping involved in his membership. Thus, there is available for programs only $4.00 of his dues. A $1.00 increase in dues provides about the same income as 7,000 new members. While every effort should be expended to attract new members to the organization, they do not provide an immediate source of income for the expanding programs of the Society.

?Will a dues increase cause a loss of members?

Past experience has indicated the contrary. As finances are available for expanded programs, engineers become more aware of value of membership. Some fear was expressed in 1946 regarding the last dues increase. Records show membership has doubled since that time.

?On what does the Society's income depend?

Since NSPE's basic philosophy is that activities on behalf of the engineering profession can best be accomplished with the active support and financing of the members of the profession, over 97% of the Society's income is received directly from dues.

?Can we secure increased revenue from the American Engineer?

Considering that $2.00 of each member's dues covers publication of the *American Engineer*, it operates within its budget. However, it is hoped that the advertising income from the magazine can be increased appreciably.

?Are efforts being made in this direction?

Yes. With advertising representatives in New York City, and active promotion by the headquarters staff, improvement is already evident in the income from this source. Competent advertising people, however, say it will be a period of several years before any appreciable advertising revenue may be expected.

?Will this improve the general financial picture of the Society?

Only to a partial degree. As the advertising revenue increases, so also will the cost of publication. Most Society publications do not pay for themselves through their advertising revenues alone.

?Will the Society operate at a deficit this year?

No. By careful financial control exercised by the Budget Committee, the programs of the Society have been trimmed to operate within the financial limitations that now exist. It is unlikely, however, that there will be any funds available to increase the Reserve and, as indicated before, there will be no carry-over for some programs of a continuing nature.

?Does the Society now have a Reserve?

Yes. Since 1947 the Society has invested over $30,000 in Treasury Bonds.

?Can we meet the present financial emergency by using the Reserve fund?

The Reserve fund, if completely exhausted, would barely cover minimum additional activities for one year. The contemplated dues increase is not based on a temporary emergency, but rather on a long-range continuing basis with expanded activities on a permanent basis and with no reason to believe the inflated costs of doing business will decrease in the foreseeable future. Also, it is sound business practice to have a Reserve fund which should be at least one year's annual budget—between $175,000 and $200,000.

?What is the size of our headquarters staff?

Four professional staff members, and ten clerical assistants. The professional staff consists of the Executive Director, the Legislative Analyst and Executive Assistant, the Editor and Public Relations Director, and the Office Manager and Business Manager of the *American Engineer*. The clerical assistants include membership clerks, secretarial, bookkeeping, filing and

(*Continued on page* 31)

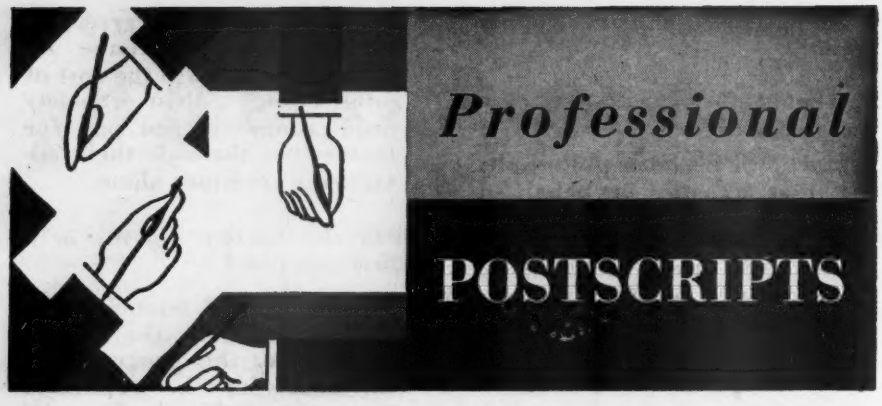
Convocation of the Centennial of Engineering—September 3-13. Hotel Sherman, Chicago, Illinois. **NSPE Meeting**—September 5.

National Council of State Boards of Engineering Examiners—Annual Meeting, September 4, 5, 6. Antlers Hotel, Colorado Springs, Colorado.

Missouri Society of Professional Engineers—Annual Meeting, October 31 and November 1. Jefferson City.

NSPE Board of Directors Meeting—November 7, 8. Jefferson Hotel, Richmond, Virginia.

Indiana Society of Professional Engineers—Annual Meeting, December 5, 6. Gary Hotel, Gary, Indiana.



This is your department. Your contributions to it are solicited. We want your views on subjects that affect the engineering profession directly or indirectly. Please keep your contributions short, and remember that editing may be necessary to conserve space. Your name may be omitted if you desire. — *The Editor.*

Where does humbleness end and foolishness begin in a materialistic world? Here is an anonymous letter commenting upon a recent —PP— item that reviews this important aspect of professional conduct. Do you agree?

—PP—

Referring to Engineer Benjamin Bean's comment in the July POSTSCRIPTS, I can concur that engineering is natural to man, but in this materialist world his idealism has been taking a terrible beating.

My engineering career began in 1918, somewhat after Engineer Bean's, and it has been interrupted by ventures into other fields which have been most illuminating. It has been from these ventures that I learned of those things whereof I wrote in the May POSTSCRIPTS. My years of service as a Chamber of Commerce manager and a City Manager rubbed off a great deal of the idealism about my profession which I had held prior to that service.

The statement of Engineer Bean's: "The only way for an engineer to gain security, real security, is to be humble enough to learn what he ought to learn about his work, do an honest days work, and prove to his employer that he is more than worth the money he is paid" should be an undisputable truth, but the effectiveness of the old copybook axioms has been blunted in our modern world. The effectiveness of the above quotation depends upon the definition of what an engineer ought to learn about his work.

From my point of view, it appears that some educators have been promoting the idea that extensive engineering knowledge is all that is needed to qualify a man for the position of chief engineer or president of the organization, whereas such positions require far more than a knowledge of engineering. May I recommend the reading of "How to Be an Employee," by Peter F. Drucker in the May 1952 issue of *Fortune*. This article and the article "How to Retire Executives," by Perrin Stryker in the June *Fortune* present some potent arguments in regard to defining what an ambitious man ought to learn. I feel that it is most unfair to the youngster in an engineering school to release him with the idea that his ability to push a slide rule or plot the moment curves is all that he needs to become the chief executive of the first firm in which he works.

It is this very "humbleness" of the engineering profession that has pushed them into the same categories with labor in the wage legislation and has made the greater majority of the profession function as employees rather than employers. It is this characteristic, supported by their inability to express themselves and sell their ideas that has put them and their works subordinate to the political offices in government service, when their works should be entirely separate and free from the vagaries of politics.

Tell me—why should a water treatment plant, a sewage plant or any other utility be directed by and subject to the wiles and whims of political domination? Why should not these be strictly engineering enterprises operated solely for the benefit and protection of the public on the revenue collected strictly for the service rendered? There are too many of these important service plants that are operated as revenue sources to support other branches of local government which may serve political machinations more effectively.

It is my hope that someday the engineers will be able to pull out of their present subservience and achieve the dominance to which they are entitled by reason of their basic training. But we cannot do this without effort and without some straight analytical thinking. I'm afraid there are too many of us who are like the farmer's new hired hand who did such a fine job on the wood pile. As a reward, the farmer sought to rest him the remainder of the day by giving him the much less arduous task of sorting and grading potatoes in the root cellar. When the farmer looked in on him late in the afternoon, he found the man sweating profusely and obviously exhausted at his task. "What's the matter?" demanded the farmer, "I thought this job would be a rest for you." "It ain't the work," protested the hand, "it's makin' these dad-burned decisions!"

—PP—

"People who live in glass houses . . ." so the old saying goes. Should engineers criticize other professions? Are all engineers *good* engineers? But, here, let

A. H. Kuhnel, P. E., of the New York SSPE and from Mount Vernon, N Y.

tell us what he thinks. How about letting us know what you think?

There was a good deal of wisdom in the piece by Professor Harold H. Munger in the July issue. However, this piece strikes a sour note in its unwarranted attack upon other professions which ought not to go unchallenged.

Professor Munger would have us believe that the Engineer alone must have respect for facts and figures. Lawyers, economists, social scientists, artists, and in fact all others are pictured as parrots, sycophants, hypocrites, wishful thinkers—fuzzy-minded muddlers whose thought processes often border on hysteria.

Surely the members of our profession have the intelligence to recognize that this picture represents a monstrous distortion of the truth without having to be subjected to several thousand well-chosen words of proof. In considering this piece, however, one might derive several profitable thoughts.

First, it would be wise to consider whether the engineering profession is so flawless that we can afford to throw brickbats at others with so little provocation. There are many individuals unimaginative enough to assume that a piece of engraved parchment is automatic proof of professional competence. These may even be discovered among us in the engineering profession. I gather that Professor Munger may have encountered a few, else why would he find it necessary to use the words "The Engineer, if he is a *real* engineer—"?

It just happens to be true that every individual who possesses the credentials of an engineer is not necessarily a *good* engineer. Why then condemn the entire legal profession merely because every lawyer is not a good lawyer? And so with the other professions.

One of the objectives of our Professional Society is to improve the standards of the profession. We have not yet completed that job. Until we do it would be wise to be very careful about throwing those stones. After all, it might be just conceivable that we could learn a thing or two from some of the other professions.

This leads to point number two. The professions which Professor Munger has treated with such great scorn and contempt deal largely with various aspects of human behaviour and human nature. Engineers often delude themselves into believing that their job is to deal with facts and figures *exclusively*. This is a serious mistake.

In his definition of the Professional Engineer in the *Encyclopaedia Britannica* Alfred Douglas Flinn wrote as follows:

"—The Engineer is under obligation to consider the sociological, economic and spiritual effects of engineering operations and to aid his fellowmen to adjust wisely their modes of living, their industrial, commercial and governmental procedures, and their educational processes so as to enjoy the greatest possible benefit from the progress achieved through our accumulating knowledge of the universe and ourselves as applied by engineering—"

It should be apparent to every engineer that the objective of his work is to supply the wants of human beings and that in performing his duties and fulfilling his obligations he must deal with human beings and with human nature at every step. In order to equip himself properly for this fundamental and essential portion of his work he will do well to seek enlightenment from lawyers, economists, psychologists, sociologists and yes, also from artists. Witness the fine example of Dr. Steinman, who learned and who teaches that engineering is far more than hard facts and figures, that it is in fact the realization of dreams, the creation of beauty, the achievement of the aspirations of mankind.

Certainly other professions have their crackpots and charlatans. So has ours. But we don't condemn the entire engineering profession because somebody once designed a bridge which fell down. Professor Munger says: "The Artist starts in a state of rebellion and ends in total futility." How many of us believe this to be a fair description of Michelangelo, of Leonardo da Vinci, of Rembrandt or of Grandma Moses? Surely this kind of thinking falls somewhat short of what the public has a right to expect from a great and learned profession.

We shall do well to recognize that there are and have been many great, brilliant, earnest and intellectually honest men at work in the arts and the social sciences. These, too, are interested in establishing the facts and in discovering basic truths. Our entire profession of engineering is founded upon the work of such men. We still have much to learn from them. When the engineering profession has learned all that it should from the social sciences we shall be much better equipped for our own work, and I venture to predict that we shall be rewarded accordingly.

—PP—

One of the interesting things about the magazine business is how long copies of certain issues continue to draw comment. For example, an article may seemingly pass unnoticed until suddenly, months later, several comments will come in the mails. At any rate, a —PP— item that appeared in March, 1952, written by Edward G. Lowell, P. E., still continues to draw some excellent letters. But, of course, the shortage is always interesting and here is

Engineer O. F. Freedner of Scarsdale, N. Y.
to give you his thoughtful views on it.

—PP—

Mr. Lowell's article dealing with the supposed shortage of engineers is worth while to be published in every major American technical magazine including "Fortune" which was wrong again as so often in the past.

His last thought is the key to the whole problem that every engineer wants a steady position and security in his profession. The outcry of a shortage of engineers which in reality does not exist is based on a wholesale construction program of government and AEC agencies, as properly stated. However a main factor is the unreasonable short term in which such contracts are supposed to be finished and the willingness of engineering firms to accept such contracts which to the best of their ability cannot be completed according to engineering standards or the head of such firm is unable to estimate properly.

Not having the necessary help of draftsmen and designers on hand and there is the real shortage, professional engineers are constantly employed as "pencil pushers" to suit the demand instead of utilizing their knowledge to supervise, coordinate and really "engineer" the job, not to speak of the unbelievable poor setup in clerical personnel to assist the engineer. No other businessman would think of setting up his business without sufficient help in typists and file clerks. In engineering outfits the PE has to write in pencil every letter he wants to be dispatched thereby wasting his valuable time. Any lawyer or doctor would not think to operate his business without a proper library, where is the engineering outfit which maintains a proper catalog file? It takes sometimes weeks to wait for an urgent information to proceed with a project.

Should we always hear that there is not enough space or money available to set up an orderly office? The fact that contracts are accepted to comparably low fees sometimes due to an intricate system of sub-and sub-sub contracts between architects, engineers and mechanical engineers is a further excuse on the part of management not to be able to pay proper wages to the professional engineer which certainly is not an invitation to induce them to stick to the engineering profession.

Re: "Paging Dale Carnegie" item in —PP —, same issue. In response to Mr. Derby's question—"What can be done about this shabby hat and tie business unpressed suits and unpolished shoes"—let me point out the following facts:

The engineer, unlike any other professional man, is found in a variety of positions. There is certainly no doubt about it, that any engineer in executive position, sales engineer or self employed is certainly properly dressed. I have not seen any one yet to look shabby. However you cannot expect to meet a field engineer or an operating engineer in a boiler or processing plant in his best dresses. The professional engineer would like to appear in public just as neat as any other professional man but what does management do to encourage the engineer to appear in proper shape? In 90% of engineering offices cloth racks are filthy, dusty and in insufficient number to provide proper storage capacity. Stacks of blueprints and dirty rolls of obsolete drawings never stored in cabinets due to lack of equipment does not contribute to keep your clothes clean. The general appearance of an engineering office with its ever dirty drafting boards can never be compared with the clean and neat appearance of a lawyers office for instance.

It is therefore not surprising that the engineer in such enterprises cannot maintain his proper appearance so long as he is a victim of his environment unless he has reached the position as an executive between his own four walls.

Any engineer out of town on a business trip or at a meeting to attend looks certainly proper.

Last, but not least, the low standards of earnings certainly do not contribute to expect sacrifices. Any employer who wants to have proper looking men in his surrounding will take care of proper installations and sufficient cleaning personnel. It's up to the "boss" to solve this problem.

—PP—

Next to the shortage, professional recognition measures up as a "favorite" for AMERICAN ENGINEER readers to write about. Here is a very fine article on the subject by

C. C. Townsend, P. E, of Daly City, Calif.

—PP—

The problem of professional recognition seems to have as many analyses as there are engineers, therefore I shall join the multitudes and offer my analysis of this problem.

We constantly attack ourselves for not taking part in civil affairs, not dressing properly and not developing our culture. We then look upon the medical and legal professions with envy because they have the recognition that we want.

Where did we get the idea that we lack participation in civil affairs? We are jealous of the medical profession in this regard, yet as many engineers as doctors achieve prominence in civil affairs. I cannot say this about the legal profession but after all, civil affairs are a lawyer's business.

Our behind the scene contributions to civil affairs will better than match any and all the other professions. How necessary would our civil affairs be if we had not made and delivered the weapons to win our wars?

We consider ourselves without culture. Who decides what culture consists of and what fields it covers. Why is it not cultivating to study the works of Newton and Edison as well as the works of Dickens and Longfellow? It seems to me that cultured activities are classed as such because they have grown so obsolete that they must bear the cultural label in order to justify their existence. Who has more right to shun this obsolescence than men whose very lives are devoted to a constant fight against obsolescence.

We, in my opinion, can hold our own with any of the professions that we envy. Why, then, don't WE have the recognition?

The doctor prides himself with his contributions to health and is very proud that he has increased the life expectancy a few years in the last century. The doctor, in adding these few years, has mostly acted as a technician administering the services made possible by engineers. The doctor, however, calls on the benefactor in person and thereby personifies the wonders of engineering in the medical world. We have given the doctor what he required to add a few years to man's life, then we have gone beyond that and through our time saving devices have made it possible for man to live several lives within his one based on standards of fifty years ago. Even so, the medical doctor enjoys professional recognition whereas we do not.

The civic leader proudly proclaims to the public what will be done for civic betterment and in the privacy of his office, he delegates the work to engineers. The engineer fulfills the civic leader's promises and tops it off by building a civilization. Again, the civic leader is recognized while the engineer is not.

Certainly these professions have not succeeded where we have failed because of their contributions to society, their dress or their culture. They have succeeded because of their relationship to society. Each of the recognized professions performs its task in personal contact with the benefactor whereas we, by necessity, perform our work several stages removed from the benefactor. Therefore, where the others constantly personify their professions, our work is symbolized by a mechanical representative.

At this time, if I were a smart engineer, I would come forth with a mathematical formula to solve this problem but being only mediocre, I can only say that our best available solution is publicity which we must build up with as much drive and ferocity as we would build a dam.

Some of my remarks may seem like feeble excuses for our failings but to me they are no more feeble or ridiculous than the charges we throw at ourselves.

With Our Members . . .

Dyer Heads Slate

Missouri Announces Nominees, Plans For 1952 Annual Meeting

The Missouri Society has announced the names of its nominees for state office and also details about its state meeting to be held October 31-November 1 at Jefferson City.

Nominees for officers for 1952 and 1953 are: Garvin H. Dyer, Independence, President; J. W. Hubler, St. Louis, First Vice President; H. J. Bruegging, Jefferson City, Second Vice President; and D. L. Robinson, Jefferson City, Secretary-Treasurer.

Nominees for two Directors-at-Large are: Huber O. Croft, Columbia; and William M. Spann, Kansas City.

MSPE's 16th Annual Meeting will be held in Jefferson City at the Hotel Governor, across the street from the Governor's Mansion, on October 31 and November 1.

Leaders of education, business, public service, engineering, and other professions will present their views on broad problems of the day as well as on fundamental problems of the engineering profession.

Chairman Paul Doll of the Annual Meeting Committee, Jefferson City, and other members of the Committee, are enthusiastic in their planning to make this a "must" for every engineer. Other members of the Committee are: Past President Bruce Williams, Joplin; H. P. Phelan, Moberly; R. E. Welsh, Kansas City.

Ladies are cordially invited to attend. A state-wide Ladies' Committee headed by Mr. George E. Wolf, Jefferson City, has planned two special social events.

San Jose Chapter Tours Quarries, Plant

Members of the San Jose Chapter of the California Society recently made a tour of the quarries and plant of the Permanente Cement Company. After the tour a color film was shown. At the regular chapter meeting, Dr. Lee Anderson, M.D., spoke on *Medical Ethics*. The subject was timely in that it closely parallels the Society's views on professionalism.

Galveston Has Picnic

Members of the Galveston County Chapter of the Texas Society recently sponsored a smorgasbord for engineers and their wives. All registered non-member engineers were invited.

Georgia Chapter Elects New Officers

Secretary Charles R. Minors, of the Northwest Chapter of the Georgia Society reports the election of officers for the Chapter for 1952. They are.

Arthur S. Booth, President; Harry M. Oldham, Vice President; Charles R. Minors, Secretary; J. C. Lifsey, Treasurer; O. Duke Booker, State Director; Directors: Mac D. Watts, Forrest W. Rhodes, Millard I. Frost, John W. Lovell.

Hill Heads Charleston Chapter Officers For '52

Results of the election of officers by the Charleston Chapter of the West Virginia Society are: President, Louis H. Hill; First Vice-President, Russell S. Simpson; Second Vice-President, Arthur K. Banks; Secretary-Treasurer, Roy D. Koch; Assistant Secretary-Treasurer, Chester A. Shuman; Directors, C. W. Hathaway, George E. Keller, James V. Karrick, and George H. Zimmerman.

Rockford Chapter Plans To Visit Centennial, Hear Eric Johnston

The Rockford Chapter of the Illinois Society laid plans to attend the Centennial of Engineering's convocation in Chicago on September 5 to hear Eric Johnston speak at NSPE's dinner. The possibilities of chartering a bus were discussed.

Large Digital Computers L. A. Meeting Subject

The Los Angeles Chapter of the California Society held a meeting on *A Survey of Large Scale Digital Computers*. Lt. T. J. Christman of the United States Navy was the speaker.

Nevada Society Holds Convention In Las Vegas

The Annual State Convention of the Nevada Society of Professional Engineers was held in Las Vegas recently. Mr. Seth Woodruff, Atomic Energy Commission Field Manager, was the guest speaker at a luncheon and presented the A.E.C. sound picture, "*Operation Greenhouse*."

This film covered the over-all operation during one series of detonations of atomic devices at Eniwetok and included several spectacular detonation scenes. Mr. Woodruff compared the Eniwetok operation with the operation of a test series at the Nevada Proving Ground, calling attention to the saving in time, supplies and personnel.

A cocktail party and buffet dinner was also held. Mr. William D. Williams of Phoenix, Arizona, Western Region Vice-President of the National Society, spoke on professionalism. Robert Millard, outgoing State President, introduced George Von Tobel, the new State President, and presented him with the State Charter. The new State Officers were introduced by Jim Shaver. First Vice President, Mel Lundberg of Elko; Second Vice Pres., Professor H. B. Blodgett of Nevada University; Third Vice Pres., J. Ray Coulter of Henderson; Secretary, R. C. Barger of Henderson; Treasurer, Norman T. Hilbrecht, Las Vegas; and National Director, Robert Millard, Ely. The new Officers of the Southern Nevada Chapter were also introduced. They are: President, Jack Miller; Vice Pres., Allye Lawson; Sec.-Treas., R. C. Barger; Trustee, Charlie Thompson; Trustee, Harlan Brown.

Grand Valley Chapter Telephone Teams Help Member Drive

The Grand Valley Chapter of the Michigan Society has appointed a Membership Committee of 17 members and "including the entire chapter" to round up new members. A telephone campaign among non-member PE's has six six-man Telephone Teams. President Wes Bintz rewards those who secure new members with a pancake supper.

Chapter Holds Picnic

The East Bay Chapter of the California Society held a picnic for the whole family instead of its last regular meeting.

Hoffeditz President Of Macon Chapter

Fred Hoffeditz is the new President of the Macon Chapter of the Georgia Society. Other officers are: James Dooley, Vice President; John Grayson, Secretary and Treasurer; Wm. H. Kubler, State Representative. Directors: Carl Schoffield, Harry Burkett, Alfred Mullins and W. H. Curry.

California Society Backs State Civil Service Reform

The California Society of Professional Engineers has been responsible for the formation of a new state Civil Service classification for highway engineering employees. A new regulation by the state personnel board places unlicensed employees in a category at a wage level below the Associate Highway Engineer.

Traveler Describes Australia, Orient

The San Jose Chapter of the California Society recently heard John D. Crummey, Chairman of the Board of Directors of the Food Machinery and Chemical Corporation, discuss points of interest on his recent trips to the Far East and Australia.

L. D. Knapp Honored By Milwaukee Group

Lloyd D. Knapp, City Engineer of Milwaukee, has been chosen "Engineer of the Month" by the Milwaukee Chapter. Mr. Knapp's duties for the city are extensive. They include such things as supervising, street construction, and railroad grade crossings, overseeing the city's water supply and many other important railroad tasks. Mr. Knapp has long been an active member of the Wisconsin Society and in NSPE.

Help! Help!

Is The American Engineer on your chapter mailing list? We'd like to carry news about what's happening in your chapter, but we need your help to do it. Why not send us a copy of your News Letter, or if you have none, why not send in a short write-up of any outstanding events? Thanks. —Editor.

Pittsburgh Leader

Glen M. Comstock (above) has been elected President of the Pittsburgh Chapter in recent balloting. Other officers named were: Robert C. Gorham, Vice President; Theodore F. Rockwell, Vice President; and Leland W. Cook and Edward A. Dines, Chapter Directors.

Use Of Batteries Shown At Hartford

A demonstration of the advantages and use of nickel-cadmium batteries was featured at the second methods night program of the Hartford County Chapter of the Connecticut Society recently. A move, *Rose Bowl Parade*, was also shown.

Texas Chapter Wants State Registration Law Enforced Vigorously

The San Jacinto Chapter of the Texas Society recently devoted an entire meeting to the subject "Enforcement of the Texas Engineering Registration Law." Members decided upon a policy of vigorous enforcement of the law to make sure that the objectives of the law are attained.

Western Michigan Chapter Ends First Year; Elects Officers

The Western Michigan Chapter recently wound up its first year of existence with a business meeting and dinner at Grand Rapids. The following new officers were elected: Ira P. Nicole, President; Robert L. Davis, Vice President; Carl J. Kirchgessner, Representative to the Michigan State Board, and Gerard N. Stelma was re-elected Secretary-Treasurer.

Colorado Society Aids In Making Fire Regulations

The Colorado Society recently played a key role in the revision of the City of Denver's Building Code. A Committee headed by CSPE member Sam Hawkes stated its views on suggested changes at a public hearing before the City Council. These were adopted and incorporated into the city's building code.

Lehigh Valley Has Live-Wire Member

The Lehigh Valley Chapter of the Pennsylvania Society has a real live wire, reports the Reading Chapter Bulletin. Six months ago Engineer Anthony J. Foderaro joined NSPE. He became so enthusiastic about the work that he secured five new members and four affiliates himself.

Doctor Outlines AMA's Early Struggles Before Seattle Chapter

Dr. M. Shelby Jared, M.D., recently spoke before the Seattle Chapter of the Washington Society and outlined the early struggles of the American Medical Society in organizing and in establishing state licensing laws for doctors.

In a business session, the following were elected officers for the administrative year beginning July 1: President, Robert C. Detrich; First Vice-President, Carl M. Berry; Second Vice-President, Robert H. Lochow; Secretary - Treasurer, George W. Graetz; Assistant Secretary, O. S. Willumsen; State Trustee, L. R. Durkee.

Bomber's Story Told

A film showing the history and development of the B-47 jet bomber was shown before the Wichita Chapter of the Kansas Society at its last meeting.

Smith Columbus Prexy

R. Wiley Smith has been elected President of the Columbus Chapter of the Georgia Society. Mr. Smith's fellow officers are: G. Jack Tankersley, Vice-President; Edwin R. DuBose, Secretary-Treasurer; Oscar L. Betts, Jr., State Director; William L. Westbrook, Past President. Directors: James C. Prather, Roy W. Wages, Thornton Cooper and Archie M. Spencer.

Save a life—contact your local blood donor center.

Delaware Society Builds Platform For Next Year

What with the political season in full swing and with both the Republicans and Democrats concocting party platforms, the Delaware Society has come up with a platform of its own. Here is its platform for progress for next year:

1. Greater participation in civic affairs.

2. Major contributions to community improvement.

3. Another ten meetings of greater interest than last year.

4. More combined meetings with other societies.

5. An Engineers' Week bigger than last year's.

6. Improved practice of good engineering ethics.

7. Every member working on a committee.

8. Total membership of 350.

At its last meeting the following assumed office in the Delaware Society: Ernest S. Van Demark, President; Senior Vice President, Thomas B. Evans; Vice President, E. Powell Smith; Secretary, Henry S. Mauk; Treasurer, F. H. McBerty; National Director, William McWilliams; Directors, Walter B. McKendrick and Leo Blumberg; and Past President, Clarence H. Evans.

New Jersey Elects Passaic's Louis Frazza New Society President

The New Jersey Society has elected the following new officers:

President, Louis Frazza of Passaic; 1st Vice President, William Dean of Essex; 2d Vice President, Charles Stillman of Hudson; National Directors: Leo McKee of Monmouth-Ocean Chapter, Frank Cooper of Union, Earl Christian, Raritan Valley, and Merton Adams of Mercer Chapter.

Edward Wickland of Delaware Valley Chapter has been named Alternate National Director and Ross McClave of Essex Trustee-at-large.

In his acceptance message, Mr. Frazza set a membership goal of 2,000, pledged the establishment of a Ladies' Auxiliary and set other goals for his administration.

Cleveland Plays Golf

The Cleveland Chapter of the Ohio Society recently held its 17th annual golf party at Pine Ridge Country Club.

The "P.E." Signature

The initials "P.E" are as important to the registered Professional Engineer as the initials "M.D." are to the physician. It is proper for a Professional Engineer to sign all professional mail "John J. Jones, P.E.", and address all business mail, "Richard L. Roe, P.E." (Not "Mr. Richard L. Roe P.E.", or "Richard L. Roe, Ph.D., P.E.") if the addressee has a senior title.

It is important that professionals use the P.E. suffix on their business cards and stationery, desk and door name plates and in all publications, registry, year-book and roster listings. More and more, society members are using the "P.E." initials after their names on personal checks, in alumni listings, on income tax returns and, in fact, wherever the full name is signed or printed.

When the public is as familiar with "P.E." as with "M.D.," Professional Engineers will have achieved a level of public recognition hitherto unattained. The Professional Engineer is not the forgotten man; he was never even known. Quite possibly the constant use of the "P.E." initials, thousands of times a day throughout the land, will change all that; and change it for the better.

. . . from the Indiana Professional Engineer

New York Engineer Given Honorary Degree

Walter E. Irving, a New York Chapter member of the NSPE and founder and president of the Irving Subway Grating Company, Long Island City, N. Y., has been presented with the honorary degree of doctor of engineering by Rensselaer Polytechnic Institute, Troy, N. Y. The honor was bestowed in recognition of his achievements as the founder of the steel grating industry. Previously, he was tendered a testimonial luncheon by the Open Steel Flooring Institute in New York as "father" of the industry. His company is celebrating its golden anniversary this year.

Missouri's Jefferson City Chapter Goes All Out Aiding City Plan

More than half of the Jefferson City Chapter's (Missouri) 107 members have been assigned to committees to study and evaluate the several definite parts of a city plan for that city which is being made.

Chapter President D. L. Robinson stated that members are lending a helping hand in making the studies to stimulate interest and to develop pertinent information and ideas prior to the time the report is completed, in early 1953.

Logan Heads Georgia's Southeast Chapter

Edward A. Logan has been elected President of the Southeast Chapter of the Georgia Society. Other officers are: Robert P. Yorke, Vice President; L. S. Miller, Jr., Secretary-Treasurer; Edward A. Logan, State Director; Ervin F. Ledford, Past President. Directors: M. E. Parker, R. T. Littlefield and Robert L. Pittman.

C. E. Barnhart Leads New Mexico Society

New officers of the New Mexico Society have assumed their offices. C. E. Barnhart is President. William G. Koulas is First Vice President; J. K. House, Second Vice President and T. T. Castonguay is Secretary-Treasurer. W. R. Underwood has been named Chairman of the Legislative Committee. Walter K. Wagner is National Director and D. R. W. Wagner-Smith is Chairman of the editorial board of the *New Mexico Professional Engineer*.

Augusta Chapter Told About Power Relays

The Augusta Chapter of the Georgia Society heard Louis Carpenter, Test Engineer of the Georgia Power Company, lead a discussion on the types of relays now in use in electrical transmission and distribution.

Muhlenberg Named To Reading Board

Charles R. Muhlenberg, a member of Reading Chapter of the Pennsylvania Society, has recently been appointed to the city planning commission by Mayor James B. Bramford of Reading. Mr. Muhlenberg will serve for five years.

Remscheid Heads Schenectady Group

Emil J. Remscheid of Scotia has assumed office as the new President of Schenectady Chapter of the New York Society, succeeding G. L. McFarland, Jr. E. W. Hutton was re-elected Secretary; as was Edward P. Smith as Treasurer.

Hartford Clambake Menu Sounds Good

The Hartford County Chapter of the Connecticut Society recently held a clambake, to which all registered engineers, members and non-members alike, were invited. The dinner menu reads like a gourmet's delight: half chicken, whole boiled lobster, potatoes, corn on the cob, vegetables, salad, rolls, butter, coffee, and dessert. Fifteen new members were admitted to the chapter at its last meeting.

Monorail Transport East Bay Topic

Monorail Transportation—Its Past, Present and Potentialities was discussed before the East Bay Chapter of the California Society by Thomas St. John. Mr. St. John illustrated his talk with pictures, data, facts and figures.

Ozark Shrimp Feed Draws Big Attendance

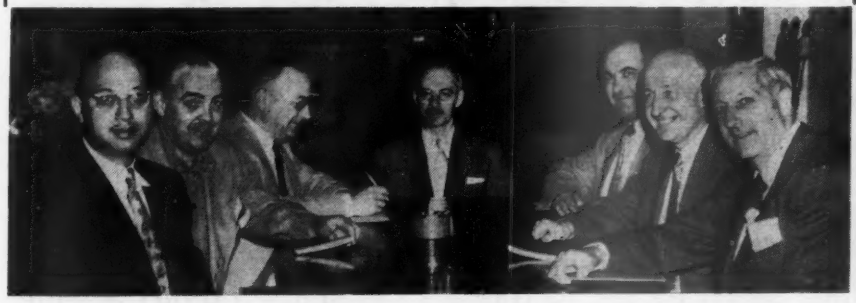
The Ozark Chapter's 12th annual Shrimp Feed held in Springfield, Mo., recently, was attended by 370 engineers and invited guests, the largest number in attendance during the 12 years the Shrimp Feed has been held, Chapter President K. L. Donaldson announced.

Miami Elects Cutler Chapter President

The Miami Chapter and the Professional Engineers Association of Southeast Florida held a joint meeting recently. New officers installed by Dr. Palmer H. Craig were: *President,* Leonard W. Culter; *Vice-President,* Herbert S. Saffir; *Secretary-Treasurer,* Michael B. Gill; *State Director,* Jules P. Channing; *Directors:* Palmer H. Craig, Calvin Jureit, F. D. R. Park, and Richard Poor.

A demonstration of prestressed concrete action by means of a model beam was presented by J. G. Stokes, District Structural Engineer of the Portland Cement Association and L. R. Robertson, Field Engineer of the Portland Cement Association.

Round Table Discussion



The Nassau County Chapter of the New York Society recently got up a round table discussion of NSPE's first public relations report, "How to Improve Engineering-Management Communications."

The discussion attracted a large attendance, fifty per cent better than average. Participants included (left to right) John Coutinho, Charles Louis, Frederick Malkmus, Walter A. Reid, Frank Merklin, Robert McDowell and Frank Saunderson.

Past Illinois President

NSPE Member Virgil Gunlock Assumes Direction Of Chicago's Public Works

Virgil E. Gunlock, past President of the Illinois Society, and presently the Commissioner of Subways and Super-highways of the City of Chicago, has just inherited important new duties in the Windy City administration.

In a reorganization of the engineering activities of Chicago, brought on by the retirement of Oscar E. Hewitt, Commissioner of Public Works, Mr. Gunlock has been appointed by Mayor Martin Kennelly to take over Mr. Hewitt's work, while retaining his present duties.

Mayor Kennelly announces that the Department of Subways and Super-Highways will become a Bureau in the Public Works Department. As of September 1, Mr. Gunlock will assume direction of such Public Works Bureaus as Maps and Plats, Architecture and Building Maintenance, Rivers and Harbors, Parks and Recreation, Aviation and Bridges and Viaducts.

A consolidated bureau of engineering is to be set up within the department of public works. Assigned to the bureau will be all of nearly 600 engineers presently working under jurisdiction of departments of Public Works, streets and electricity, and Subways and Super-highways. It was reported Richard Van Gorp, assistant to Gunlock now, is a leading prospect for head of the new engineering bureau.

Talks On Concrete

H. C. Sommerschield, representative from Chicago Chapter, recently presented a paper on *Prestressed Concrete* before Illinois' DuKane Chapter.

L. R. Durkee Elected Washington President; Cites Need For Members

The Washington Society recently elected Engineer L. R. Durkee, President of the state society in the group's annual meeting held in the Hotel Olympian in Olympia.

Other officers named were Wallace Bergerson, Vice President; Robert Detrich, Treasurer, and Howard Stingle, National Director. Ed Smith is Executive Secretary.

In assuming office, Mr. Durkee declared that Washington's biggest project is inaugurating a successful membership campaign.

Palm Beach Chapter Installs Officers

The Annual Ladies Night and Installation of Officers Meeting of the West Palm Beach Chapter of the Florida Society was held recently at the Flotilla Club. The following officers-elect were installed by retiring President Oxer: President Roy E. Weber, First Vice-President Ernest Malloch, Second Vice-President Walter J. Eddlebutt, Jr., Secretary-Treasurer Theodore B. Jenson.

Undertaken As Public Service

Colorado Society Committee Report Bans Joint Auto-Railroad Tunnel Use

Proposed joint use of the Moffat railway tunnel as a highway as well as a railroad bore has been ruled out by the Moffat Tunnel Committee of Professional Engineers.

The Committee was made up of members of the Colorado Society who lent their talents gratis, to the state as a public service.

In a report to Mark U. Watrous, chief highway engineer, the committee said numerous possibilities had been studied but that "there is no possibility" of so converting the tunnel to dual use.

A two-lane tunnel, built parallel to the present bore, the committee reported, would cost $41 million, and an additional $1 million would be required to light, ventilate, maintain and equip the bore.

"The committee reluctantly comes to the conclusion that none of the methods of joint operation will pay the fixed charges involved in putting the methods to use," the report read.

The survey was undertaken by the committee at the request of the department of highways under an authorization by the state legislature.

Many Suggestions

Among suggestions examined but turned down were construction of a removable wooden floor on each side and between the railroad rails; enlargement of the tunnel to provide a motor traffic lane; a new tunnel providing two traffic lanes, and ferrying automobiles on flat-cars.

One big problem was ventilation. Only 198 vehicles in sixteen hours could pass through the tunnel even with controlled ventilation, the report disclosed.

The average daily traffic volume is 325 vehicles consisting of 255 passenger cars, sixty-five trucks and five buses.

Daily cost of operating the tunnel with use of a removable wooden floor would amount to $827 and "would not pay out," the report stated. Enlargement of the tunnel would cost nearly as much as construction of another one. The flatcar ferry idea was ruled out as too costly—$5 per automobile and $10 per truck.

The committee also pointed out that use of the tunnel by motor vehicles entailed considerable "hazard," including breakdowns and subsequent delay of traffic; accidents, ventilation and cases of seizure of claustrophobia.

World's Longest

"There is no precedent for use of a tunnel of such length," the committee pointed out. The longest tunnel for this purpose is the Mersey River Vehicle tunnel in England which has a length of 11,254 feet."

Increased efficiency and technological improvements in the driving of tunnels would not lower costs, the committee said. Cost of a new tunnel would be more than it was for the original bore.

Members of the committee are Ivan C. Crawford, chairman; E. O. Davis, J. J. Donajue, J. J. Johnson, Arthur A. Matthews, J. H. McCabe, L. M. Robertson, L. E. Rollins, A. J. Ryan and A. F. Weers.

The thirty-page report contains an appendix which covers specific reports on the cost of approach roads to the tunnel, cost of timber-driving surface, itemized cost for a new vehicular tunnel and reports on lighting, ventilation and legal aspects.

Lake County Member Honored For Service

Through the efforts of C. A. Anderson, Lake County Chapter of the Illinois Society has been obtaining some excellent publicity for the Centennial of Engineering in their local paper, the Waukegan *News-Sun*.

Mr. William G. Weber, member of Lake County Chapter, ISPE, was recently honored for forty years of service with the Illinois Bell Telephone Co. at a luncheon held in Waukegan.

NSPE Central Region Plans Meeting Sept. 12-13

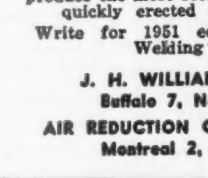
Mr. E. W. Seeger, Vice-President of NSPE's Central Area, has planned a regional meeting to be held in LaCrosse, Wis., on September 12 and 13. This will be a joint meeting with the Wisconsin State Society. Convention headquarters will be at the Stoddard Hotel.

The following subjects are on the agenda: (1) A discussion of how to implement the recent research survey report, "How to Improve Engineering-Management Communications," (2) Dues, (3) Common operating problems.

All NSPE members are cordially invited to attend.

Northeast Chapter Views Health Center

A tour of the newly completed building of the Athens-Clarke County Health Center as guests of Dr. Wedford W. Brown, Health Commissioner, was the principal feature of a recent meeting of Northeast Chapter of the Georgia Society which was attended by about fifty members, their ladies and guests.



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Dues

(*Continued from page 23*)

production personnel. The ratio of staff members to total membership in NSPE is lower by nearly three times that of other professional societies, according to a recent survey.

?Can we cut down on any of our activities in order to concentrate on others?

A special committee was appointed last year to explore thoroughly this possibility. Their interim report to the Board at Tulsa indicated further study was necessary. Supplementing the study of this committee, the Executive and Budget Committees are reviewing each activity as it is authorized in the light of limited financing. The headquarters staff is instituting a series of surveys to determine ways and means by which more efficient operation of the multitude of headquarters duties can be accomplished.

Conveyors

(*Continued from page 14*)

stituted a formidable barrier to trade. What to do about it?

The answer was that Denny Hill, as the mountain was named, was loaded. bit by bit, onto a 3,000 foot-long conveyor and sent on its way to waiting scows in Puget Sound, from there it was carried to deep water and dumped. Three hundred working days later, Denny Hill was just an unpleasant memory.

After having thus dramatically proved its worth, the conveyor ushered in a new era in the movement of materials. (Most of the great dams built in America were made possible by conveyors: Grand Coulee, Shasta, Friant, Anderson, Boysen, Hungry Horse and Canyon Ferry.)

Perhaps the most exotic now being made of conveyors is by the Chileans. who use them to carry coal out of a mine two miles under the Pacific Ocean.

One of the most astonishing examples of the low cost of a conveyor system properly adapted to the work it is doing is the Colonial Dock Mine of the Frick Coke Company. Carrying coal four-and-a-half miles from the mine to the Monongahela River. costs of operation over a ten year period stood at .0044 cents per ton mile!

As far as conveyors are concerned. basic principles have undergone little change since Oliver Evans first advertised back in 1791 that he could save at least half the labor cost of (as he put it) "attending" a flour mill, but there are many advances and refinements in design — materials — application—and in the humanitarian aspects. Conveyors and other mechanized handling devices were developed primarily because man's needs had outgrown his muscles — because muscle power became far too expensive. Studies of the Twentieth Century Fund reveal that human muscle power costs $10 per horsepower hour —animal muscle costs 75¢—and—electricity costs about 4¢ per horsepower hour. Think that over the next time you see some poor chaps wrestling with a casting or a crate on a shipping dock or anywhere else.—***End.***

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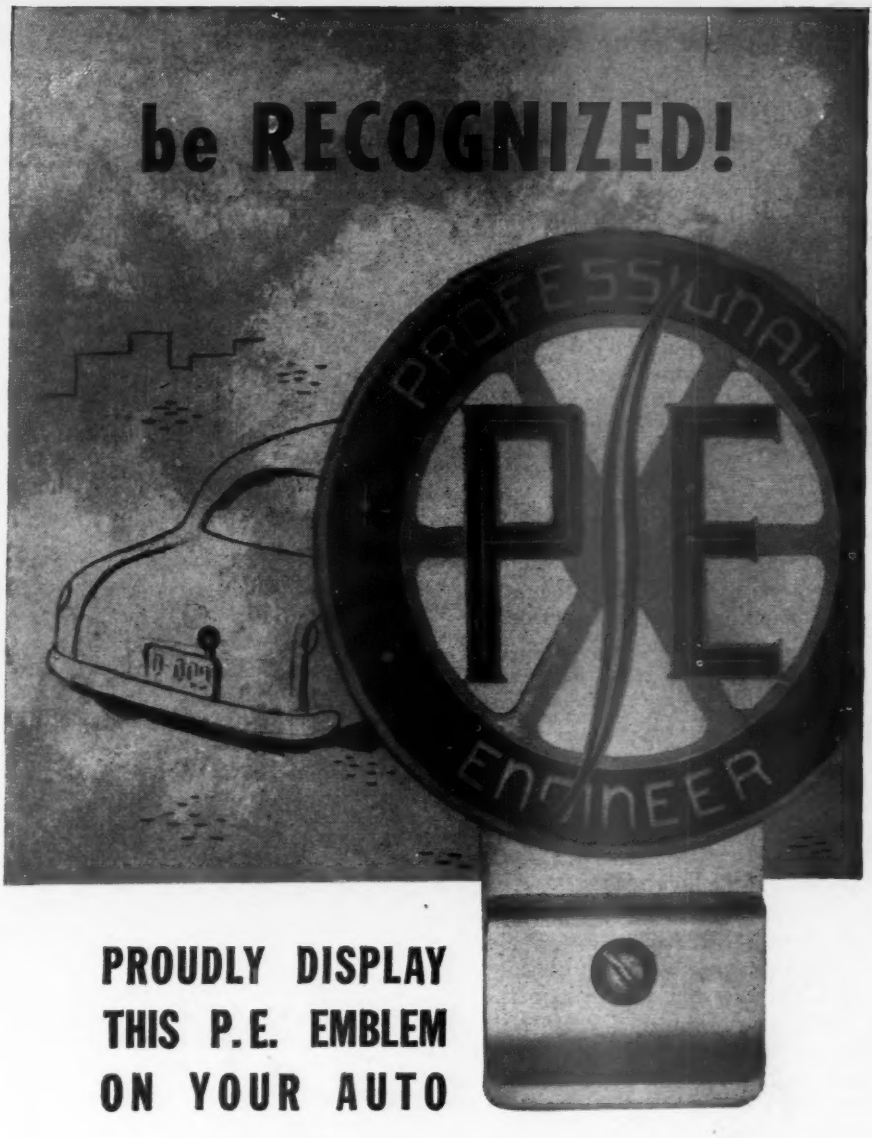

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What's New

As a service to our readers, this column will describe briefly new product developments of general interest to professional engineers. For further information concerning these products, we will appreciate your filling in the coupon provided for this purpose, and mailing it to the American Engineer.

● **Now available is a new ready-mixed aluminum paint that, when applied to practically any metal surface, becomes permanently bonded to this surface upon subjecting this painted metal to heat of from 500 degrees to 1,600 degrees Fahrenheit.**

Because of this phenomenon, the applications and uses of Sheffield "Super-Hot" answers many problems of maintenance and protection, as well as opens up new avenues of permanently finishing manufactured metal products. Originally developed to protect and decorate metal surfaces where extreme heat is required, Sheffield "Super-Hot" will add a protective and decorative finish to furnaces, pipes, boilers, ovens and other metal surfaces withstanding 1600 degrees of heat. The greater the heat, the more permanent the bond. ***Item 1.***

● **Production of a new close-coupled-type horizontal cellar drainer has been announced.**

This new unit provides positive protection from flooded cellars without the limitations and disadvantages of the conventional vertical submerged-type drainers.

This pump unit is never subject to binding or clogging due to accumulated silt, sand, coal, dust, ashes, etc. in sump, because the pump itself is not in the pit.

Other important selling features are that the sump and strainer are easily cleaned (no need to disconnect discharge piping or move pump), the motor is not subject to vapor, moisture, or fumes from the sump (since the motor is not over the sump) and the unit may be set away from the sump (up to 8 feet offset possible—often desirable in tight locations).

The close-coupled construction of this unit assures permanent alignment of rotating parts, the centrifugal pump is self-priming, and the impeller and guide vane are of non-rusting bronze.

The new unit is in full-scale production, and descriptive literature is available. ***Item 2.***

● **A new 148-page roller chain engineering data book No. 2457 has just been published by Link-Belt Company and is now available for distribution.**

It is one of the most comprehensive books ever developed on roller chain and its application. Detailed engineering information covers the selection, installation, lubrication, and maintenance of roller chain for drives and conveyors, and sprocket wheels.

For reference and easy identification, the book contains a large number of photographs and line drawings of the many types and sizes of chain and sprocket wheels available in the Link-Belt precision steel roller chain line. In addition, over 50 typical conveyor chain attachments are shown.

The user, applying his information to the data in the book, can determine the proper roller chain for any application. The design notes and selection data serve as a practical textbook on the use of roller chain for both power transmission and conveying service. Formulas, charts, diagrams and typical problems simplify selection.

To facilitate selection of drives for normal requirements, one section of 24 pages contains a comprehensive group of pre-selected drives which are available for delivery from stock.

A copy of Book No. 2457 will be sent without charge, on request, to interested persons. ***Item 3.***

● **The Draw-In-Dex cabinet files material safely, neatly, conveniently without wrinkles, creases or curled edges; saves valuable hours searching for misplaced prints. It is carefully designed and engineered to meet the problems of every organization that uses blueprints, drawings, tracings, surveys, maps, plans, charts, photostats, photo blow-ups, and art work, etc.**

Draw-In-Dex accommodates 1,250 prints. Each print hangs smoothly, index file locates the prints instantly. All prints immediately accessible. Any print removable without disturbing the others. Suspension rods support the drawings that are very easily attached to manila hangers. Newly developed aluminum hangers permit filing a large number of drawings together. Cabinet is designed so that when the front panel is opened, any drawing may be immediately filed or removed. ***Item 4.***

● **A new booklet on Steeltex Floor Lath contains material of interest to engineers, designers, and architects.**

Floor Lath is a combination form and reinforcement for concrete floors and roofs over steel or concrete joist construction.

The booklet contains specifications, test data, safe loads, information and instructions on how to install Steeltex Floor Lath.

Copies are available upon request. ***Item 5.***

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